CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS
VOLUME 1 – BID BOOKLET

SINGLE PLA CONTRACT VERSION

TABLE OF CONTENTS

Introduction 2
Bid Submission Requirements 3
Notices to Bidders 4
- Project Labor Agreement & Single Contract 4
- Pre Bid Questions (PBQs) 4
- NYC Contract Financing Loan Fund 4

M/WBE Notice to Prospective Contractors 5
Affirmation 13
Pre-Award Process 15
Project References 17
- A. Contracts completed by the bidder 17
- B. Contracts currently under construction by the bidder 18
- C. Pending contracts not yet started by the bidder 19

Introduction

This Bid Booklet is intended to provide general information necessary for bidding on a DDC public works project and is part of the Contract Documents, as per Article 1.1 of the Standard Construction Contract.

As this contract is solicited via the PASSPort system, the bidder will be required to complete all of the PASSPort forms and questionnaires. These forms and questionnaires, along with the bidder's responses, will become part of the Bid Booklet.

Additional information on the PASSPort system can be found at the following website:
https://www1.nyc.gov/site/mocs/systems/passport-user-materials.page

Bid Submission Requirements

THE FOLLOWING MUST BE COMPLETED AND SUBMITTED FOR THE BID TO BE CONSIDERED RESPONSIVE:

1. Completed electronic bid submission in PASSPort;
    a. All required fields in PASSPort must be completed.
2. Bid security, if required.
    a. If Bid security is in a form of a bid bond, bidders must include it with their electronic PASSPort submission.
    b. If Bid security is in a form of a certified check, bidders must hand deliver the certified check.

BIDDERS ARE ADVISED THAT PAPER BID SUBMISSIONS WILL BE DEEMED NON-RESPONSIVE. BIDDERS MUST SUBMIT THEIR BIDS ELECTRONICALLY IN PASSPORT AND PROVIDE THE BID SECURITY FOR THE BID TO BE CONSIDERED RESPONSIVE.

THE FOLLOWING MAY RESULT IN THE BID BEING FOUND NON-RESPONSIVE:

1. Failure to upload required files or documents as part of a mandatory PASSPort Questionnaire response.
2. Uploading an incorrect file as part of a mandatory PASSPort Questionnaire response.

Notices to Bidders

Project Labor Agreement & Single Contract

PROJECT LABOR AGREEMENT: This contract is subject to a Project Labor Agreement ("PLA") entered into between the City and the Building and Construction Trades Council of Greater New York ("BCTC") affiliated Local Unions. By submitting a bid, the Contractor agrees that the PLA is binding on the Contractor and all subcontractors of all tiers. The bidder to be awarded the contract will be required to execute a "Letter of Assent" prior to award.

The Bidder is advised to review the following: (1) Notice regarding the PLA, (2) the PLA, and (3) the Letter of Assent, all of which are set forth at the beginning of Volume 2 of the Contract Documents.

SINGLE CONTRACT: As stated above, this contract is subject to a PLA. The requirements of the Wicks Law for separate prime contractors DO NOT APPLY to any project that is covered by a PLA. Accordingly, the requirements of the Wicks Law for separate prime contractors do not apply to this Project. The Project consists of a single contract.

The Bidder is advised to review the Notice set forth at the beginning of Volume 2 of the Contract Documents. The Notice specifies revisions to the Contract Documents to provide that the Project consists of a single contract and to delete any and all references to separate prime contractors.

Pre Bid Questions (PBQs)

Please be advised that PBQs must be submitted to the Agency Contact Person via PASSPort (in the RFx Discussions with buyer section) within the timeframe indicated in the PASSPort procurement.

NYC Contract Financing Loan Fund

If your business is working as a prime or subcontractor on a project with a City agency or City-funded entity, you may be eligible for a Contract Financing Loan from a participating lender coordinated with the NYC Department of Small Business Services (SBS). Loan repayment terms align with the contract payment schedule.

For more information: Call 311 or visit https://www1.nyc.gov/nycbusiness/article/contract-financing-loan-fund

M/WBE Notice to Prospective Contractors

PARTICIPATION BY MINORITY-OWNED AND WOMEN-OWNED BUSINESS ENTERPRISES IN CITY PROCUREMENT (9/2020 version)

ARTICLE I. M/WBE PROGRAM

Section 6-129 of the Administrative Code of the City of New York ("Section 6-129") establishes the program for participation in City procurement ("M/WBE Program") by minority-owned business enterprises ("MBEs") and women-owned business enterprises ("WBEs"), certified in accordance with Section 1304 of the New York City Charter. As stated in Section 6-129, the intent of the program is to address the impact of discrimination on the City's procurement process, and to promote the public interest in avoiding fraud and favoritism in the procurement process, increasing competition for City business, and lowering contract costs. The contract provisions contained herein are pursuant to Section 6-129, and the rules of the Department of Small Business Services ("DSBS") promulgated thereunder.

If this Contract is subject to the M/WBE Program established by Section 6-129, the specific requirements of MBE and/or WBE participation for this Contract are set forth in Schedule B of the Contract (entitled the "M/WBE Utilization Plan") and are detailed below. Contracts solicited through the Procurement and Sourcing Solutions Portal (PASSPort) will contain a Schedule B in the format outlined in the Schedule B – M/WBE Utilization Plan & PASSPort rider. The provisions of this notice will apply to contracts subject to the M/WBE Program established by Section 6-129 regardless of solicitation source.

The Contractor must comply with all applicable MBE and WBE requirements for this Contract.

All provisions of Section 6-129 are hereby incorporated in the Contract by reference and all terms used herein that are not defined herein shall have the meanings given such terms in Section 6-129.

References to MBEs or WBEs shall also include such businesses certified pursuant to the executive law where credit is required by section 311 of the New York City Charter or other provision of law.

Article I, Part A, below, sets forth provisions related to the participation goals for construction, standard and professional services contracts.

Article I, Part B, below, sets forth miscellaneous provisions related to the M/WBE Program.

PART A

PARTICIPATION GOALS FOR CONSTRUCTION, STANDARD

AND PROFESSIONAL SERVICES CONTRACTS OR TASK ORDERS

1. The **MBE and/or WBE Participation Goals** established for this Contract or Task Orders issued pursuant to this Contract, ("**Participation Goals**"), as applicable, are set forth on Schedule B, Part 1 to this Contract (see Page 1, Line 1 Total Participation Goals) or will be set forth on Schedule B, Part 1 to Task Orders issued pursuant to this Contract, as applicable.

The **Participation Goals** represent a percentage of the total dollar value of the Contract or Task Order, as applicable, that may be achieved by awarding subcontracts to firms certified with DSBS as MBEs and/or WBEs, and/or by crediting the participation of prime contractors and/or qualified joint ventures as provided in Section 3 below, unless the goals have been waived or modified by Agency in accordance with Section 6-129 and Part A, Sections 10 and 11 below, respectively.

2. If **Participation Goals** have been established for this Contract or Task Orders issued pursuant to this Contract, Contractor agrees or shall agree as a material term of the Contract that Contractor shall be subject to the **Participation Goals**, unless the goals are waived or modified by Agency in accordance with Section 6-129 and Part A, Sections 10 and 11 below, respectively.

3. If **Participation Goals** have been established for this Contract or Task Order issued pursuant to this Contract, a Contractor that is an MBE and/or WBE shall be permitted to count its own participation toward fulfillment of the relevant **Participation Goal**, provided that in accordance with Section 6-129 the value of Contractor's participation shall be determined by subtracting from the total value of the Contract or Task Order, as applicable, any amounts that the Contractor pays to direct subcontractors (as defined in Section 6-129(c)(13)), and provided further that a Contractor that is certified as both an MBE and a WBE may count its own participation either toward the goal for MBEs or the goal for WBEs, but not both.

A Contractor that is a qualified joint venture (as defined in Section 6-129(c)(30)) shall be permitted to count a percentage of its own participation toward fulfillment of the relevant **Participation Goal**. In accordance with Section 6-129, the value of Contractor's participation shall be determined by subtracting from the total value of the Contract or Task Order, as applicable, any amounts that Contractor pays to direct subcontractors, and then multiplying the remainder by the percentage to be applied to total profit to determine the amount to which an MBE or WBE is entitled pursuant to the joint venture agreement, provided that where a participant in a joint venture is certified as both an MBE and a WBE, such amount shall be counted either toward the goal for MBEs or the goal for WBEs, but not both.

4. A. If **Participation Goals** have been established for this Contract, a prospective contractor shall be required to submit with its bid or proposal, as applicable, a completed Schedule B, M/WBE Utilization Plan, Part 2 (see Pages1-2) indicating: (a) whether the contractor is an MBE or WBE, or qualified joint venture; (b) the percentage of work it intends to award to direct subcontractors; (c) in cases where the contractor intends to award direct subcontracts, a description of the type and dollar value of work designated for participation by MBEs and/or WBEs, and the time frames in which such work is scheduled to begin and end; as well as the name, addresses, and telephone numbers of the M/WBE subcontractors if required by the solicitation; and (d) the prospective contractor's required certification and affirmations. In the event that this M/WBE Utilization Plan indicates that the bidder or proposer, as applicable, does not intend to meet the **Participation Goals**, the bid or proposal, as applicable, shall be deemed non-responsive, unless Agency has granted the bidder or proposer, as applicable, a pre-award waiver of the **Participation Goals** in accordance with Section 6-129 and Part A, Section 10 below.

B. (i) If this Contract is for a master services agreement or other requirements type contract that will result in the issuance of Task Orders that will be individually registered ("Master Services Agreement") and is subject to M/WBE **Participation Goals**, a prospective contractor shall be required to submit with its bid or proposal, as applicable, a completed Schedule B, M/WBE Participation Requirements for Master Services Agreements That Will Require Individually Registered Task Orders, Part 2 (page 2) indicating the prospective contractor's certification and required affirmations to make all reasonable good faith efforts to meet participation goals established on each individual Task Order issued pursuant to this Contract, or if a partial waiver is obtained or such goals are modified by the Agency, to meet the modified **Participation Goals** by soliciting and obtaining the participation of certified MBE and/or WBE firms. In the event that the Schedule B indicates that the bidder or proposer, as applicable, does not intend to meet the **Participation Goals** that may be established on Task Orders issued pursuant to this Contract, the bid or proposal, as applicable, shall be deemed non-responsive.

(ii) **Participation Goals** on a Master Services Agreement will be established for individual Task Orders issued after the Master Services Agreement is awarded. If **Participation Goals** have been established on a Task Order, a contractor shall be required to submit a Schedule B – M/WBE Utilization Plan For Independently Registered Task Orders That Are Issued Pursuant to Master Services Agreements, Part 2 (see Pages 1-2) indicating: (a) whether the contractor is an MBE or WBE, or qualified joint venture; (b) the percentage of work it intends to award to direct subcontractors; (c) in cases where the contractor intends to award direct subcontracts, a description of the type and dollar value of work designated for participation by MBEs and/or WBEs, and the time frames in which such work is scheduled to begin and end; as well as the name, addresses, and telephone numbers of the M/WBE subcontractors if required by the solicitation; and (d) the prospective contractor's required certification and affirmations. The contractor must engage in good faith efforts to meet the **Participation Goals** as established for the Task Order unless Agency has granted the contractor a pre-award waiver of the **Participation Goals** in accordance with Section 6-129 and Part A, Section 10 below.

C. THE BIDDER/PROPOSER MUST COMPLETE THE SCHEDULE B INCLUDED HEREIN (SCHEDULE B, PART 2). A SCHEDULE B SUBMITTED BY THE BIDDER/PROPOSER WHICH DOES NOT INCLUDE THE VENDOR CERTIFICATION AND REQUIRED AFFIRMATIONS WILL BE DEEMED TO BE NON-RESPONSIVE, UNLESS A FULL WAIVER OF THE PARTICIPATION GOALS IS GRANTED (SCHEDULE B, PART 3). IN THE EVENT THAT THE CITY DETERMINES THAT THE BIDDER/PROPOSER HAS SUBMITTED A SCHEDULE B WHERE THE VENDOR CERTIFICATION AND REQUIRED AFFIRMATIONS ARE COMPLETED BUT OTHER ASPECTS OF THE SCHEDULE B ARE NOT COMPLETE, OR CONTAIN A COPY OR COMPUTATION ERROR THAT IS AT ODDS WITH THE VENDOR CERTIFICATION AND AFFIRMATIONS, THE BIDDER/PROPOSER WILL BE NOTIFIED BY THE AGENCY AND WILL BE GIVEN FOUR (4) CALENDAR DAYS FROM RECEIPT OF NOTIFICATION TO CURE THE SPECIFIED DEFICIENCIES AND RETURN A COMPLETED SCHEDULE B TO THE AGENCY. FAILURE TO DO SO WILL RESULT IN A DETERMINATION THAT THE BID/PROPOSAL IS NON-RESPONSIVE. RECEIPT OF NOTIFICATION IS DEFINED AS THE DATE NOTICE IS E-MAILED OR FAXED (IF THE BIDDER/PROPOSER HAS PROVIDED AN E-MAIL ADDRESS OR FAX NUMBER), OR NO LATER THAN FIVE (5) CALENDAR DAYS FROM THE DATE OF MAILING OR UPON DELIVERY, IF DELIVERED.

5. Where an **M/WBE** Utilization Plan has been submitted, the Contractor shall, within 30 days of issuance by Agency of a notice to proceed, submit a list of proposed persons or entities to which it intends to award subcontracts within the subsequent 12 months. In the case of multi-year contracts, such list shall also be submitted every year thereafter. The Agency may also require the Contractor to report periodically about the contracts awarded by its direct subcontractors to indirect subcontractors (as defined in Section 6-129(c)(22)). **PLEASE NOTE: If this Contract is a public works project subject to GML §101(5) (i.e., a contract valued at or below $3M for projects in New York City) or if the Contract is subject to a project labor agreement in accordance with Labor Law §222, and the bidder is required to identify at the time of bid submission its intended subcontractors for the Wicks trades (plumbing and gas fitting; steam heating, hot water heating, ventilating and air conditioning (HVAC); and electric wiring), the Contractor must identify all those to which it intends to award construction subcontracts for any portion of the Wicks trade work at the time of bid submission, regardless of what point in the life of the contract such subcontracts will occur. In identifying intended subcontractors in the bid submission, bidders may satisfy any Participation Goals established for this Contract by proposing one or more subcontractors that are MBEs and/or WBEs for any portion of the Wicks trade work.** In the event that the Contractor's selection of a subcontractor is disapproved, the Contractor shall have a reasonable time to propose alternate subcontractors.

6. MBE and WBE firms must be certified by DSBS in order for the Contractor to credit such firms' participation toward the attainment of the **Participation Goals**. Such certification must occur prior to the

firms' commencement of work. A list of city-certified MBE and WBE firms may be obtained from the DSBS website at www.nyc.gov/buycertified, by emailing DSBS at buyer@sbs.nyc.gov, by calling (212) 513-6451, or by visiting or writing DSBS at One Liberty Plaza, New York, New York, 10006, 11th floor. Eligible firms that have not yet been certified may contact DSBS in order to seek certification by visiting www.nyc.gov/getcertified, emailing MWBE@sbs.nyc.gov, or calling the DSBS certification helpline at (212) 513-6311. A firm that is certified as both an MBE and a WBE may be counted either toward the goal for MBEs or the goal for WBEs, but not both. No credit shall be given for participation by a graduate MBE or graduate WBE, as defined in Section 6-129(c)(20).

7. Where an **M/WBE** Utilization Plan has been submitted, the Contractor shall, with each voucher for payment, and/or periodically as Agency may require, submit statements, certified under penalty of perjury, which shall include, but not be limited to,: the total amount the Contractor paid to its direct subcontractors, and, where applicable pursuant to Section 6-129(j), the total amount direct subcontractors paid to indirect subcontractors; the names, addresses and contact numbers of each MBE or WBE hired as a subcontractor by the Contractor, and, where applicable, hired by any of the Contractor's direct subcontractors; and the dates and amounts paid to each MBE or WBE. The Contractor shall also submit, along with its voucher for final payment: the total amount it paid to subcontractors, and, where applicable pursuant to Section 6-129(j), the total amount its direct subcontractors paid directly to their indirect subcontractors; and a final list, certified under penalty of perjury, which shall include the name, address and contact information of each subcontractor that is an MBE or WBE, the work performed by, and the dates and amounts paid to each.

8. If payments made to, or work performed by, MBEs or WBEs are less than the amount specified in the Contractor's **M/WBE** Utilization Plan, Agency shall take appropriate action, in accordance with Section 6-129 and Article II below, unless the Contractor has obtained a modification of its **M/WBE** Utilization Plan in accordance with Section 6-129 and Part A, Section 11 below.

9. Where an **M/WBE** Utilization Plan has been submitted, and the Contractor requests a change order the value of which exceeds the greater of 10 percent of the Contract or Task Order, as applicable, or $500,000, Agency shall review the scope of work for the Contract or Task Order, as applicable, and the scale and types of work involved in the change order, and determine whether the **Participation Goals** should be modified.

10. Pre-award waiver of **the Participation Goals**.

(a) A bidder or proposer, or contractor with respect to a Task Order, may seek a pre-award full or partial waiver of the Participation Goals in accordance with Section 6-129, which requests that Agency change one or more **Participation Goals** on the grounds that the **Participation Goals** are unreasonable in light of the availability of certified firms to perform the services required, or by demonstrating that it has legitimate business reasons for proposing a lower level of subcontracting in its M/WBE Utilization Plan.

(b) To apply for a full or partial waiver of the **Participation Goals**, a bidder, proposer, or contractor, as applicable, must complete Part 3 of Schedule B **and submit such request no later than seven (7) calendar days prior to the date and time the bids, proposals, or Task Orders are due, in writing to the Agency by email at MWBEModification@ddc.nyc.gov**. **Full or partial waiver requests that are received later than seven (7) calendar days prior to the date and time the bids, proposals, or Task Orders are due may be rejected as untimely**. Bidders, proposers, or contractors, as applicable, who have submitted timely requests will receive an Agency response by no later than two (2) calendar days prior to the due date for bids, proposals, or Task Orders; provided, however, that if that date would fall on a weekend or holiday, an

Agency response will be provided by close-of-business on the business day before such weekend or holiday date.

(c) If the Agency determines that the **Participation Goals** are unreasonable in light of the availability of certified firms to perform the services required, it shall revise the solicitation and extend the deadline for bids and proposals, or revise the Task Order, as applicable.

(d) Agency may grant a full or partial waiver of the **Participation Goals** to a bidder, proposer or contractor, as applicable, who demonstrates—before submission of the bid, proposal or Task Order, as applicable—that it has legitimate business reasons for proposing the level of

subcontracting in its **M/WBE** Utilization Plan. In making its determination, Agency shall consider factors that shall include, but not be limited to, whether the bidder, proposer or contractor, as applicable, has the capacity and the bona fide intention to perform the Contract without any subcontracting, or to perform the Contract without awarding the amount of subcontracts represented by the **Participation Goals**. In making such determination, Agency may consider whether the **M/WBE** Utilization Plan is consistent with past subcontracting practices of the bidder, proposer or contractor, as applicable, whether the bidder, proposer or contractor, as applicable, has made efforts to form a joint venture with a certified firm, and whether the bidder, proposer, or contractor, as applicable, has made good faith efforts to identify other portions of the Contract that it intends to subcontract.

11. Modification of **M/WBE** Utilization Plan. (a) A Contractor may request a modification of its **M/WBE** Utilization Plan after award of this Contract. **PLEASE NOTE: If this Contract is a public works project subject to GML §101(5) (i.e., a contract valued at or below $3M for projects in New York City) or if the Contract is subject to a project labor agreement in accordance with Labor Law §222, and the bidder is required to identify at the time of bid submission its intended subcontractors for the Wicks trades (plumbing and gas fitting; steam heating, hot water heating, ventilating and air conditioning (HVAC); and electric wiring), the Contractor may request a Modification of its M/WBE Utilization Plan as part of its bid submission.** The Agency may grant a request for Modification of a Contractor's **M/WBE** Utilization Plan if it determines that the Contractor has established, with appropriate documentary and other evidence, that it made reasonable, good faith efforts to meet the **Participation Goals**. In making such determination, Agency shall consider evidence of the following efforts, as applicable, along with any other relevant factors:

(i) The Contractor advertised opportunities to participate in the Contract, where appropriate, in general circulation media, trade and professional association publications and small business media, and publications of minority and women's business organizations;

(ii) The Contractor provided notice of specific opportunities to participate in the Contract, in a timely manner, to minority and women's business organizations;

(iii) The Contractor sent written notices, by certified mail or facsimile, in a timely manner, to advise MBEs or WBEs that their interest in the Contract was solicited;

(iv) The Contractor made efforts to identify portions of the work that could be substituted for portions originally designated for participation by MBEs and/or WBEs in the **M/WBE** Utilization Plan, and for which the Contractor claims an inability to retain MBEs or WBEs;

(v) The Contractor held meetings with MBEs and/or WBEs prior to the date their bids or proposals were due, for the purpose of explaining in detail the scope and requirements of the work for which their bids or proposals were solicited;

(vi) The Contractor made efforts to negotiate with MBEs and/or WBEs as relevant to perform specific subcontracts, or act as suppliers or service providers;

(vii) Timely written requests for assistance made by the Contractor to Agency's M/WBE liaison officer and to DSBS;

(viii) Description of how recommendations made by DSBS and Agency were acted upon and an explanation of why action upon such recommendations did not lead to the desired level of participation of MBEs and/or WBEs.

Agency's M/WBE officer shall provide written notice to the Contractor of the determination.

(b) The Agency may modify the **Participation Goals** when the scope of the work has been changed by the Agency in a manner that affects the scale and types of work that the Contractor indicated in its **M/WBE Utilization Plan** would be awarded to subcontractors.

12. If the Contractor was required to identify in its bid or proposal the MBEs and/or WBEs they intended to use in connection with the performance of the Contract or Task Order, substitutions to the identified firms may only be made with the approval of the Agency, which shall only be given when the Contractor has proposed to use a firm that would satisfy the **Participation Goals** to the same extent as the firm previously identified, unless the Agency determines that the Contractor has established, with appropriate documentary and other evidence, that it made reasonable, good faith efforts. In making such determination, the Agency shall require evidence of the efforts listed in Section 11(a) above, as applicable, along with any other relevant factors.

13. If this Contract is for an indefinite quantity of construction, standard or professional services or is a requirements type contract and the Contractor has submitted an **M/WBE** Utilization Plan and has committed to subcontract work to MBEs and/or WBEs in order to meet the **Participation Goals**, the Contractor will not be deemed in violation of the M/WBE Program requirements for this Contract with regard to any work which was intended to be subcontracted to an MBE and/or WBE to the extent that the Agency has determined that such work is not needed.

14. If **Participation Goals** have been established for this Contract or a Task Order issued pursuant to this Contract, at least once annually during the term of the Contract or Task Order, as applicable, Agency shall review the Contractor's progress toward attainment of its **M/WBE** Utilization Plan, including but not limited to, by reviewing the percentage of work the Contractor has actually awarded to MBE and/or WBE subcontractors and the payments the Contractor made to such subcontractors.

15. If **Participation Goals** have been established for this Contract or a Task Order issued pursuant to this Contract, Agency shall evaluate and assess the Contractor's performance in meeting those goals, and such evaluation and assessment shall become part of the Contractor's overall contract performance evaluation.

PART B

MISCELLANEOUS

1. The Contractor shall take notice that, if this solicitation requires the establishment of a **M/WBE** Utilization Plan, the resulting contract may be audited by DSBS to determine compliance with Section 6-129. See §6-129(e)(10). Furthermore, such resulting contract may also be examined by the City's Comptroller to assess compliance with the **M/WBE** Utilization Plan.

2. Pursuant to DSBS rules, construction contracts that include a requirement for a **M/WBE** Utilization Plan shall not be subject to the law governing Locally Based Enterprises set forth in Section 6-108.1 of the Administrative Code of the City of New York.

3. DSBS is available to assist contractors and potential contractors in determining the availability of MBEs and/or WBEs to participate as subcontractors, and in identifying opportunities that are appropriate for participation by MBEs and/or WBEs in contracts.

4. Prospective contractors are encouraged to enter into qualified joint venture agreements with MBEs and/or WBEs as defined by Section 6-129(c)(30).

5. By submitting a bid or proposal the Contractor hereby acknowledges its understanding of the M/WBE Program requirements set forth herein and the pertinent provisions of Section 6-129, and any rules promulgated thereunder, and if awarded this Contract, the Contractor hereby agrees to comply with the M/WBE Program requirements of this Contract and pertinent provisions of Section 6-129, and any rules promulgated thereunder, all of which shall be deemed to be material terms of this Contract. The Contractor hereby agrees to make all reasonable, good faith efforts to solicit and obtain the participation of MBEs and/or WBEs to meet the required **Participation Goals**.

ARTICLE II. ENFORCEMENT

1. If Agency determines that a bidder or proposer, as applicable, has, in relation to this procurement, violated Section 6-129 or the DSBS rules promulgated pursuant to Section 6-129, Agency may disqualify such bidder or proposer, as applicable, from competing for this Contract and the Agency may revoke such bidder's or proposer's prequalification status, if applicable.

2. Whenever Agency believes that the Contractor or a subcontractor is not in compliance with Section 6-129 or the DSBS rules promulgated pursuant to Section 6-129, or any provision of this Contract that implements Section 6-129, including, but not limited to any **M/WBE** Utilization Plan, Agency shall send a written notice to the Contractor describing the alleged noncompliance and offering the Contractor an opportunity to be heard. Agency shall then conduct an investigation to determine whether such Contractor or subcontractor is in compliance.

3. In the event that the Contractor has been found to have violated Section 6-129, the DSBS rules promulgated pursuant to Section 6-129, or any provision of this Contract that implements Section 6-129, including, but not limited to, any **M/WBE** Utilization Plan, Agency may determine that one of the following actions should be taken:

(a) entering into an agreement with the Contractor allowing the Contractor to cure the violation;

(b) revoking the Contractor's pre-qualification to bid or make proposals for future contracts;

(c) making a finding that the Contractor is in default of the Contract;

(d) terminating the Contract;

(e) declaring the Contractor to be in breach of Contract;

(f) withholding payment or reimbursement;

(g) determining not to renew the Contract;

(h) assessing actual and consequential damages;

(i) assessing liquidated damages or reducing fees, provided that liquidated damages may be based on amounts representing costs of delays in carrying out the purposes of the M/WBE Program, or in meeting the purposes of the Contract, the costs of meeting utilization goals through additional procurements, the administrative costs of investigation and enforcement, or other factors set forth in the Contract;

(j) exercising rights under the Contract to procure goods, services or construction from another contractor and charge the cost of such contract to the Contractor that has been found to be in noncompliance; or

(k) taking any other appropriate remedy.

4. If an **M/WBE** Utilization Plan has been submitted, and pursuant to this Article II, Section 3, the Contractor has been found to have failed to fulfill its **Participation Goals** contained in its **M/WBE** Utilization Plan or the **Participation Goals** as modified by Agency pursuant to Article I, Part A, Section 11, Agency may assess liquidated damages in the amount of ten percent (10%) of the difference between the dollar amount of work required to be awarded to MBE and/or WBE firms to meet the **Participation Goals** and the dollar amount the Contractor actually awarded and paid, and/or credited, to MBE and/or WBE firms. In view of the difficulty of accurately ascertaining the loss which the City will suffer by reason of Contractor's failure to meet the **Participation Goals**, the foregoing amount is hereby fixed and agreed as the liquidated damages that the City will suffer by reason of such failure, and not as a penalty. Agency may deduct and retain out of any monies which may become due under this Contract the amount of any such liquidated damages; and in case the amount which may become due under this Contract shall be less than the amount of liquidated damages suffered by the City, the Contractor shall be liable to pay the difference.

5. Whenever Agency has reason to believe that an MBE and/or WBE is not qualified for certification, or is participating in a contract in a manner that does not serve a commercially useful function (as defined in Section 6-129(c)(8)), or has violated any provision of Section 6-129, Agency shall notify the Commissioner of DSBS who shall determine whether the certification of such business enterprise should be revoked.

6. Statements made in any instrument submitted to Agency pursuant to Section 6-129 shall be submitted under penalty of perjury and any false or misleading statement or omission shall be grounds for the application of any applicable criminal and/or civil penalties for perjury. The making of a false or fraudulent statement by an MBE and/or WBE in any instrument submitted pursuant to Section 6-129 shall, in addition, be grounds for revocation of its certification.

7. The Contractor's record in implementing its **M/WBE** Utilization Plan shall be a factor in the evaluation of its performance. Whenever Agency determines that a Contractor's compliance with an **M/WBE** Utilization Plan has been unsatisfactory, Agency shall, after consultation with the City Chief Procurement Officer, file an advice of caution form for inclusion in PASSPort as caution data.

Affirmation

The Bidder affirms and declares:

1. The said bidder is of lawful age and the only one interested in this bid; and no person, firm or corporation other than hereinbefore named has any interest in this bid, or in the Contract proposed to be taken.
2. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief: (1) the prices in this bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor; (2) unless otherwise required by law, the prices quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and (3) no attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
3. No councilman or other officer or employee or person whose salary is payable in whole or in part from the City Treasury is directly or indirectly interested in this bid, or in the supplies, materials, equipment, work or labor to which it relates, or in any of the profits thereof.
4. The bidder is not in arrears to the City of New York upon debt or contract or taxes, and is not a defaulter, as surety or otherwise, upon any obligation of the City of New York, and has not been declared not responsible, or disqualified, by any agency of the City of New York or State of New York, nor is there any proceeding pending relating to the responsibility or qualification of the bidder to receive public contracts except as disclosed in PASSPort.
5. The bidder hereby affirms that is has paid all applicable City income, excise and other taxes for all it has conducted business activities in New York City.
6. The bidder, as an individual, or as a member, partner, director or officer of the bidder, if the same be a firm, partnership or corporation, executes this document expressly warranting and representing that should this bid be accepted by the City and the Contract awarded to him, he and his subcontractors engaged in the performance:

   (1) will comply with the provisions of Section 6-108 of the Administrative Code of the City of New York and the non-discrimination provisions of Section 220a of the New York State Labor Law, as more expressly and in detail set forth in the Agreement; (2) will comply with Section 6-109 of the Administrative Code of the City of New York in relation to minimum wages and other stipulations as more expressly and in detail set forth in the Agreement; (3) have complied with the provisions of the aforesaid laws since their respective effective dates, and (4) will post notices to be furnished by the City, setting forth the requirements of the aforesaid laws in prominent and conspicuous places in each and every plant, factory, building and structure where employees engaged in the performance of the Contract can readily view it, and will continue to keep such notices posted until the supplies, materials and equipment, or work labor and services required to be furnished or rendered by the Contractor have been finally accepted by the City. In the event of any breach or violation of the foregoing, the Contractor may be subject to damages, liquidated or otherwise, cancellation of the Contract and suspension as a

bidder for a period of three years. (The words, "the bidder", "he", "his", and "him" where used shall mean the individual bidder, firm, partnership or corporation executing this bid).

7. Compliance Report

   The bidder, as an individual, or as a member, partner, director, or officer of the bidder, if the same be a firm, partnership, or corporation, (1) represents that his attention has been specifically drawn to Executive Order No. 50, dated April 25, 1980, on Equal Employment Compliance of the contract, and (2) warrants that he will comply with the provisions of Executive Order No. 50. The Employment Report must be submitted as part of the bid.

8. The bidder, as an individual, or as a member, partner, director, or officer of the bidder, if the same be a firm, partnership, or corporation, executes this document expressly warranting that he will comply with: (1) the provision of the contract on providing records, Chapter 8.

9. By submission of this bid, the bidder certifies that it now has and will continue to have the financial capability to fully perform the work required for this contract. Any award of this contract will be made in reliance upon such certification. Upon request therefor, the bidder will submit written verification of such financial capability in a form that is acceptable to the department.

10. In accordance with Section 165 of the State Finance Law, the bidder agrees that tropical hardwoods, as defined in Section 165 of the State Finance Law, shall not be utilized in the performance of this Contract, except as the same are permitted by the foregoing provision of law.

11. The bidder has visited and examined the site of the work and has carefully examined the Contract in the form approved by the Corporation Counsel, and will execute the Contract and perform all its items, covenants and conditions, and will provide, furnish and deliver all the work, materials, supplies, tools and appliances for all labor and materials necessary or required for the hereinafter named work, all in strict conformity with the Contract, for the prices set forth in the Bid Schedule.

12. M/WBE UTILIZATION PLAN: By signing its bid, the bidder agrees to the M/WBE Vendor Certification and Required Affirmations set forth below, unless a full waiver of the Participation Goals is granted.

    I hereby:

    1) acknowledge my understanding of the M/WBE participation requirements as set forth in this Contract and the pertinent provisions of Section 6-129 of the Administrative Code of the City of New York and the rules promulgated thereunder;

    2) affirm that the information supplied in support of the M/WBE Utilization Plan is true and correct;

    3) agree, if awarded this Contract, to comply with the M/WBE participation requirements of this Contract, the pertinent provisions of Section 6-129, and the rules promulgated thereunder, all of which shall be deemed to be material terms of this Contract;

    4) agree and affirm that it is a material term of this Contract that the Vendor will award the total dollar value of the M/WBE Participation Goals to certified MBEs and/or WBEs, unless a full waiver is obtained or such goals are modified by the Agency; and

    agree and affirm, if awarded this Contract, to make all reasonable, good faith efforts to meet the M/WBE Participation Goals, or If a partial waiver is obtained or such goals are modified by the Agency, to meet the modified Participation Goals by soliciting and obtaining the participation of certified MBE and/or WBE firms.

Pre-Award Process

The bidder is advised that as part of the pre-award review of its bid, it may be required to submit the information described in Sections (A) through (D) below. If required, the bidder must submit such information within five (5) business days following receipt of notification from DDC that it is among the low bidders. Such notification from DDC will be by email and will specify the types of information which must be submitted directly to DDC.

In the event the bidder fails to submit the required information within the specified time frame, its bid may be rejected as nonresponsive.

****

(A) **Project Reference Form**: If required, the bidder must complete and submit the Project Reference Form set forth in this Bid Booklet. The Project Reference Form consists of 3 parts: (1) Contracts Completed by the Bidder, (2) Contracts Currently Under Construction by the Bidder, and (3) Pending Contracts Not Yet Started by the Bidder.

(B) **Copy of License**: If required, the bidder must submit a copy of the license under which the bidder will be performing the work. Such license must clearly show the following: (1) Name of the Licensee, (2) License Number, and (3) Expiration date of the License. A copy of the license will be required from bidders for the following contracts: Plumbing Work, Electrical Work and Asbestos Abatement.

(C) **Financial Information**: If required, the bidder must submit the financial information described below:

(1) Audited Financial Statements: Financial statements (Balance Sheet and Income Statement) of the entity submitting the bid, as audited by an independent auditor licensed to practice as a certified public accountant (CPA). Audited financial statements for the three most recent fiscal years must be submitted. Each such financial statement must include the auditor's standard report.

If the bidder does not have audited financial statements, it must submit an affidavit attesting to the fact that the bidder does not have such statements. In addition, the bidder must submit the following documentation covering the three most recent fiscal years: signed federal tax returns, unaudited financial statements, and a "certified review letter" from a certified public accountant (CPA) verifying the unaudited financial statements.

Unless the most recent audited or unaudited financial statement was issued within ninety (90) days, the bidder must submit interim financial information that includes data on financial position and results of operation (income data) for the current fiscal year. Such information may be summarized on a monthly or quarterly basis or at other intervals.

(2) Schedule of Aged Accounts Receivable, including portion due within ninety (90) days.

(D) **Project Specific Information**: If required, the bidder must submit the project specific information described below:

(1) Statement indicating the number of years of experience the bidder has had and in what type of construction.

(2) Resumes of all key personnel to be involved in the project, including the proposed project superintendent.

(3) List of significant pieces of equipment expected to be used for the contract, and whether such equipment is owned or leased.

(4) Description of work expected to be subcontracted, and to what firms, if known.

(5) List of key material suppliers.

(6) Preliminary bar chart time schedule

(7) Contractor's expected means of financing the project. This should be based on the assumption that the contractor is required to finance 2X average monthly billings throughout the contract period.

(8) Any other issues the contractor sees as impacting his ability to complete the project according to the contract.

In addition to the information described in Sections (A) through (D) above, the bidder must submit such additional information as the Commissioner may require, including without limitation, an additional bid breakdown file which is detailed to the CSI Section level, coordinated with the Contract specifications, as well as an explanation or justification for specific unit price items.

The bidder is further advised that it may be required to attend a pre-award meeting with DDC representatives. If such a meeting is convened, the bidder will be advised as to any additional material to be provided.

Project References

A. Contracts completed by the bidder

List all contracts substantially completed within the last 4 years, up to a maximum of 10, in descending order of date of substantial completion.

Project & Location	Contract Type	Contract Amount ($000)	Date Completed	Owner Reference & Tel. No.	Architect/Engineer Reference & Tel. No. (if different from owner)
PS 16-Staten Island	SCA-CIP	$ 7,764,000	11/15/23	Ms. Melissa Leahy 718-752-5740	SCA
PS 10-Brooklyn	SCA-CIP	$16,664,000	10/14/23	Mr. Rajender Gujaral 917-418-2851	SCA
424 Albee Square/K478 Brooklyn	SCA-LINE	$22,364,000	9/15/23	Ms. Maeve Marcello 917-299-9567	SCA
PS 190-Brooklyn	SCA-CIP	$8,464,400	7/16/23	Mr. Ramsundar Adinarayan 718-472-8151	SCA
PS 154-Bronx	SCA-CIP	$8,944,000	5/17/23	Tara Presume 347-906-0195	SCA
PS 189 - Brooklyn	SCA-CIP	$7,664,400	9/15/22	Mr. Ronald Mezi 646-772-3943	SCA
IS 34 - Staten Island	SCA-CIP	$23,246,400	9/30/22	Mr. Michael Galea 917-579-0788	SCA
Old Boys HS - Brooklyn	SCA-CIP	$9,436,400	9/10/21	Mr. Rajender Gujaral 917-418-2851	SCA
Alfred E Smith-Bronx	SCA-CIP	$9,144,400	8/27/21	Mr. Jabran Hameed 917-745-2848	SCA

B. Contracts currently under construction by the bidder

List all contracts currently under construction even if they are not similar to the contract being awarded.

Project & Location	Contract Type	Contract Amount ($000)	Subcontracted to Others ($000)	Uncompleted Portion ($000)	Date Scheduled to Complete	Owner Reference & Tel. No.	Architect/ Engineer Reference & Tel. No. (if different from owner)
100 Centre Street 100 Centre Street New York, NY 10038	GC - Tank Replacement	$4,143,300	$1,515,000	$1,614,000	July 2025	NYC DDC Sylvester Kodua - PM 718-391-3208	Dean Tsignopoulos Dewberry Engineers 212-685-0900
The Royale Condominium 188 East 64th Street New York, NY 10065	GC - Interior Renovation	$382,240	$300,000	$227,334	April 2025	Bennett Lee State of victor H, Lee & Bennett J. Lee	Elisabeth Martin MDA designgroup 212-627-7788
Clemente Soto Velez 107 Suffolk Street New York, NY 10002	GC - Interior Renovation & New Elev. Shaft	$10,433,000	$3,617,000	$5,329,000	June 2025	NYC DDC Elizabeth Lowery - PM 718-391-2138	Kit Yan Sage & Coombe Arch 212-226-9600
Flushing Town Hall Elevator Modernization 137-35 Northern Blvd. Flushing, NY 11354	GC - Ineterior Elevator Renovation	$911,000	$296,450	$20,500	March 2025	NYC DDC Diana Conti 646-879-3408	Charles Lauster Charles Lauster, Arch 212-679-1110

C. Pending contracts not yet started by the bidder

List all contracts awarded to or won by the bidder but not yet started.

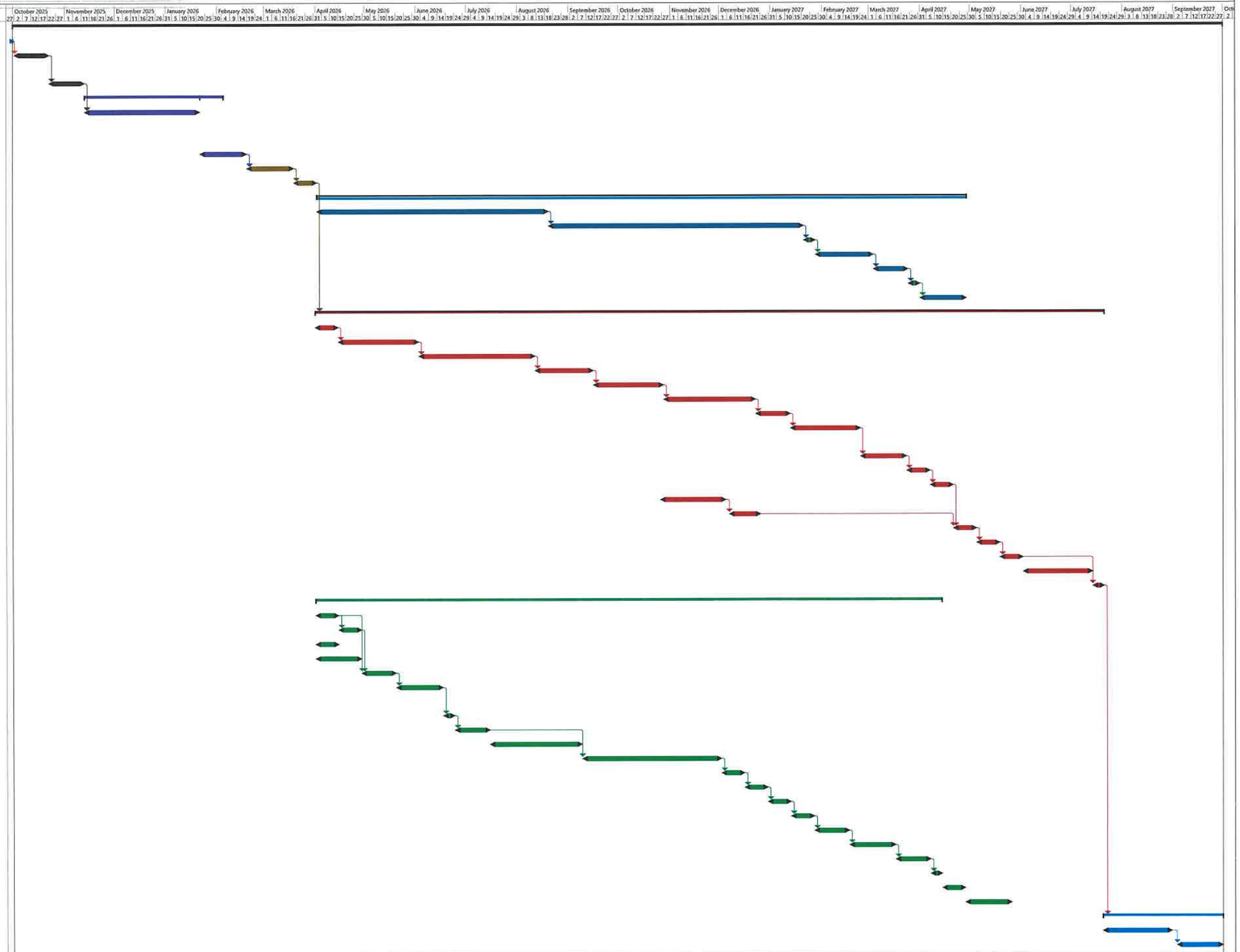
Project & Location	Contract Type	Contract Amount ($000)	Date Scheduled to Start	Owner Reference & Tel. No.	Architect/Engineer Reference & Tel. No. (if different from owner)
The Bryant Library 2 Papermill Road Roslyn, NY 11576	GC - Renovation for new ADA Bathroom & Kitchenette	$333,300	March 2025	Tracey Arena - Owners Rep Calgi Construction Mang. 914-682-9423 x 104	Peter Gisolfi Associates LLP 914-476-3677

Proposed schedule

ID		Task Mode	Task Name	Duration	Start	Finish
1			Astoria Branch Library	522 days	Wed 10/1/25	Thu 9/30/27
2			Notice to Proceed	1 day	Wed 10/1/25	Wed 10/1/25
3			DDC Submittal/ approval credentials/RFAS	3 wks	Thu 10/2/25	Wed 10/22/25
4			AMC Permits	3 wks	Thu 10/23/25	Wed 11/12/25
5			**Asbestos/Lead removal**	**60 days**	**Thu 11/13/25**	**Wed 2/4/26**
6			Mobilization/ Temp walls/ Protection/AMC/Lea	10 wks	Thu 11/13/25	Wed 1/21/26
7			Close out Documents	4 wks	Thu 1/22/26	Wed 2/18/26
8			Approved Drawings	4 wks	Thu 2/19/26	Wed 3/18/26
9			Permits	2 wks	Thu 3/19/26	Wed 4/1/26
10			**ELEVATOR**	**280 days**	**Thu 4/2/26**	**Wed 4/28/27**
11			Submittals/Shop Drawings	20 wks	Thu 4/2/26	Wed 8/19/26
12			Fabrication	22 wks	Thu 8/20/26	Wed 1/20/27
13			Mobilization	1 wk	Thu 1/21/27	Wed 1/27/27
14			Installation	5 wks	Thu 1/28/27	Wed 3/3/27
15			Final Inspection	3 wks	Thu 3/4/27	Wed 3/24/27
16			Punchlist	1 wk	Thu 3/25/27	Wed 3/31/27
17			Close out Documents	4 wks	Thu 4/1/27	Wed 4/28/27
18			**Interior**	**340 days**	**Wed 4/1/26**	**Tue 7/20/27**
19			Mobilization	2 wks	Wed 4/1/26	Tue 4/14/26
20			Interior Demo	7 wks	Wed 4/15/26	Tue 6/2/26
21			Interior Steel Beams/Decking	10 wks	Wed 6/3/26	Tue 8/11/26
22			Interior Concrete	5 wks	Wed 8/12/26	Tue 9/15/26
23			Interior Framing	6 wks	Wed 9/16/26	Tue 10/27/26
24			MEP's Roughing	8 wks	Wed 10/28/26	Tue 12/22/26
25			MEP's Inspections	3 wks	Wed 12/23/26	Tue 1/12/27
26			Insulation/Fireproofing/Sheetrock/ Taping	6 wks	Wed 1/13/27	Tue 2/23/27
27			Tile/Flooring	4 wks	Wed 2/24/27	Tue 3/23/27
28			Finish Doors/Trim	2 wks	Wed 3/24/27	Tue 4/6/27
29			Prime Paint	2 wks	Wed 4/7/27	Tue 4/20/27
30			Bookshelves/Furniture	6 wks	Mon 10/26/26	Fri 12/4/26
31			Finish Paint	3 wks	Mon 12/7/26	Fri 12/25/26
32			MEP's Finishes	2 wks	Wed 4/21/27	Tue 5/4/27
33			Finishes	2 wks	Wed 5/5/27	Tue 5/18/27
34			Punchlist	2 wks	Wed 5/19/27	Tue 6/1/27
35			Final Inspections	6 wks	Wed 6/2/27	Tue 7/13/27
36			Demobilization	1 wk	Wed 7/14/27	Tue 7/20/27
37			**Exterior**	**300 days**	**Wed 4/1/26**	**Tue 5/25/27**
38			Mobilization	2 wks	Wed 4/1/26	Tue 4/14/26
39			Erosion/Tree Protection control	2 wks	Wed 4/15/26	Tue 4/28/26
40			Temp Support Excavation/ Piles	2 wks	Wed 4/1/26	Tue 4/14/26
41			Underpinning	4 wks	Wed 4/1/26	Tue 4/28/26
42			Demo/Excavation/Removal	3 wks	Wed 4/29/26	Tue 5/19/26
43			Concrete Footing/Foundations/Walls	4 wks	Wed 5/20/26	Tue 6/16/26
44			Waterproofing/Controlled Backfill	1 wk	Wed 6/17/26	Tue 6/23/26
45			Brick opening /Replacement	3 wks	Wed 6/24/26	Tue 7/14/26
46			Steel Post/Lintels/framing	8 wks	Wed 7/15/26	Tue 9/8/26
47			Windows/Glazing/Curtain walls	12 wks	Wed 9/9/26	Tue 12/1/26
48			Roofing/Coping/Paint	2 wks	Wed 12/2/26	Tue 12/15/26
49			Drainage	2 wks	Wed 12/16/26	Tue 12/29/26
50			Undergrounds	2 wks	Wed 12/30/26	Tue 1/12/27
51			Concrete/Curbs/Bollards	2 wks	Wed 1/13/27	Tue 1/26/27
52			Site work/Grading	3 wks	Wed 1/27/27	Tue 2/16/27
53			Sidewalks/Flagpole/Fencing	4 wks	Wed 2/17/27	Tue 3/16/27
54			Landscaping/Green Roofs	3 wks	Wed 3/17/27	Tue 4/6/27
55			Exterior Signs and Finishes	1 wk	Wed 4/7/27	Tue 4/13/27
56			Punchlist	2 wks	Wed 4/14/27	Tue 4/27/27
57			Final Inspection	4 wks	Wed 4/28/27	Tue 5/25/27
58			**CLOSE OUT DOCUMENTS**	**53 days**	**Tue 7/20/27**	**Thu 9/30/27**
59			Final Close Out Documents	6 wks	Tue 7/20/27	Mon 8/30/27
60			CO	4 wks	Fri 9/3/27	Thu 9/30/27

JOBCO INCORPORATED

ID	Task Mode	Task Name	Duration	Start	Finish
1		**Astoria Branch Library**	**522 days**	**Wed 10/1/25**	**Thu 9/30/27**
2		Notice to Proceed	1 day	Wed 10/1/25	Wed 10/1/25
3		DDC Submittal/ approval credentials/RFAS	3 wks	Thu 10/2/25	Wed 10/22/25
4		AMC Permits	3 wks	Thu 10/23/25	Wed 11/12/25
5		**Asbestos/Lead removal**	**60 days**	**Thu 11/13/25**	**Wed 2/4/26**
6		Mobilization/ Temp walls/ Protection/AMC/Lead removal/sign off	10 wks	Thu 11/13/25	Wed 1/21/26
7		Close out Documents	4 wks	Thu 1/22/26	Wed 2/18/26
8		**Approved Drawings**	4 wks	Thu 2/19/26	Wed 3/18/26
9		**Permits**	2 wks	Thu 3/19/26	Wed 4/1/26
10		**ELEVATOR**	**280 days**	**Thu 4/2/26**	**Wed 4/28/27**
11		Submittals/Shop Drawings	20 wks	Thu 4/2/26	Wed 8/19/26
12		Fabrication	22 wks	Thu 8/20/26	Wed 1/20/27
13		Mobilization	1 wk	Thu 1/21/27	Wed 1/27/27
14		Installation	5 wks	Thu 1/28/27	Wed 3/3/27
15		Final Inspection	3 wks	Thu 3/4/27	Wed 3/24/27
16		Punchlist	1 wk	Thu 3/25/27	Wed 3/31/27
17		Close out Documents	4 wks	Thu 4/1/27	Wed 4/28/27
18		**Interior**	**340 days**	**Wed 4/1/26**	**Tue 7/20/27**
19		Mobilization	2 wks	Wed 4/1/26	Tue 4/14/26
20		Interior Demo	7 wks	Wed 4/15/26	Tue 6/2/26
21		Interior Steel Beams/Decking	10 wks	Wed 6/3/26	Tue 8/11/26
22		Interior Concrete	5 wks	Wed 8/12/26	Tue 9/15/26
23		Interior Framing	6 wks	Wed 9/16/26	Tue 10/27/26
24		MEP's Roughing	8 wks	Wed 10/28/26	Tue 12/22/26
25		MEP's Inspections	3 wks	Wed 12/23/26	Tue 1/12/27
26		Insulation/Fireproofing/Sheetrock/ Taping	6 wks	Wed 1/13/27	Tue 2/23/27
27		Tile/Flooring	4 wks	Wed 2/24/27	Tue 3/23/27
28		Finish Doors/Trim	2 wks	Wed 3/24/27	Tue 4/6/27
29		Prime Paint	2 wks	Wed 4/7/27	Tue 4/20/27
30		Bookshelves/Furniture	6 wks	Mon 10/26/26	Fri 12/4/26
31		Finish Paint	3 wks	Mon 12/7/26	Fri 12/25/26
32		MEP's Finishes	2 wks	Wed 4/21/27	Tue 5/4/27
33		Finishes	2 wks	Wed 5/5/27	Tue 5/18/27
34		Punchlist	2 wks	Wed 5/19/27	Tue 6/1/27
35		Final Inspections	6 wks	Wed 6/2/27	Tue 7/13/27
36		Demobilization	1 wk	Wed 7/14/27	Tue 7/20/27
37		**Exterior**	**300 days**	**Wed 4/1/26**	**Tue 5/25/27**
38		Mobilization	2 wks	Wed 4/1/26	Tue 4/14/26
39		Erosion/Tree Protection control	2 wks	Wed 4/15/26	Tue 4/28/26
40		Temp Support Excavation/ Piles	2 wks	Wed 4/1/26	Tue 4/14/26
41		Underpinning	4 wks	Wed 4/1/26	Tue 4/28/26
42		Demo/Excavation/Removal	3 wks	Wed 4/29/26	Tue 5/19/26
43		Concrete Footing/Foundations/Walls	4 wks	Wed 5/20/26	Tue 6/16/26
44		Waterproofing/Controlled Backfill	1 wk	Wed 6/17/26	Tue 6/23/26
45		Brick opening /Replacement	3 wks	Wed 6/24/26	Tue 7/14/26
46		Steel Post/Lintels/framing	8 wks	Wed 7/15/26	Tue 9/8/26
47		Windows/Glazing/Curtain walls	12 wks	Wed 9/9/26	Tue 12/1/26
48		Roofing/Coping/Paint	2 wks	Wed 12/2/26	Tue 12/15/26
49		Drainage	2 wks	Wed 12/16/26	Tue 12/29/26
50		Undergrounds	2 wks	Wed 12/30/26	Tue 1/12/27
51		Concrete/Curbs/Bollards	2 wks	Wed 1/13/27	Tue 1/26/27
52		Site work/Grading	3 wks	Wed 1/27/27	Tue 2/16/27
53		Sidewalks/Flagpole/Fencing	4 wks	Wed 2/17/27	Tue 3/16/27
54		Landscaping/Green Roofs	3 wks	Wed 3/17/27	Tue 4/6/27
55		Exterior Signs and Finishes	1 wk	Wed 4/7/27	Tue 4/13/27
56		Punchlist	2 wks	Wed 4/14/27	Tue 4/27/27
57		Final Inspection	4 wks	Wed 4/28/27	Tue 5/25/27
58		**CLOSE OUT DOCUMENTS**	**53 days**	**Tue 7/20/27**	**Thu 9/30/27**
59		Final Close Out Documents	6 wks	Tue 7/20/27	Mon 8/30/27
60		CO	4 wks	Fri 9/3/27	Thu 9/30/27



Project: Astoria Branch Library Renovation
14-01 Astoria Blvd Queens, NY, 11102
Date: 10/1/2025

Task | Split | Milestone | Summary | Project Summary | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | External Tasks | External Milestone | Deadline | Progress | Manual Progress

**** Dates Are Subject To Change Due To Unforeseen Conditions ****

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
		DIVISION 01 - GENERAL REQUIREMENTS									
					General Requirements: DIVISION 01 - GENERAL REQUIREMENTS EXCUDING the following 6 items: 1) 01 50 00; 3.4-Temporary Electrical Service.2) 01 50 00; 3.5-Temporary Heat. 3) 01 50 00; 3.8-Field Office. 4) 01 50 00; 3.14-Rodent and Insect Control. 5) 01 50 00; 3.18-Security Guards.6) 01 54 23; 1.9-Sidewalk Sheds.These 6 items must be filled out separately on the Bid Submission Form and PASSPort Item Grid. (for details see tab "HardCostGeneralRequirements" at Division 1 General Requirements sheet)						
					ADMINISTRATIVE REQUIREMENTS	1.00	JOB	$ 50,000.00	$ 275,000.00	$ -	$ 325,000.00
					QUALITY REQUIREMENTS	1.00	JOB	$ 5,000.00	$ 100,000.00		$ 105,000.00
					TEMPORARY FACILITIES AND CONTROLS	1.00	JOB	$ 25,000.00	$ 10,000.00	$ -	$ 35,000.00
					PRODUCT REQUIREMENTS	1.00	JOB				$ -
					EXECUTION AND CLOSEOUT REQUIREMENTS	1.00	JOB	$ 5,000.00	$ 10,000.00	$ -	$ 15,000.00
					LIFE CYCLE ACTIVITIES	1.00	JOB	$ 150,000.00	$ 550,000.00	$ 50,000.00	$ 750,000.00
					LICENSE FEES	1.00	JOB	$ 5,000.00			$ 5,000.00
					PERMIT COSTS	1.00	JOB	$ 20,000.00			$ 20,000.00
					BOND FEES	1.00	JOB	$ 120,000.00		$ -	$ 120,000.00
					INSURANCE	1.00	JOB	$ 600,000.00		$ -	$ 600,000.00
		copy above cell and insert copied cell above the row									
					SUB TOTAL						**$ 1,975,000.00**
		DIVISION 02 - EXISTING CONDITIONS									
			02 41 19 Selective Demolition					$ 80,000.00	$ 500,000.00		$ 580,000.00
					REMOVE EXISTING FENCE AT PORCH	24.00	LF	$ 400.00	$ 2,000.00		$ 2,400.00
					REMOVE EXISTING EXTERIOR SIGNAGE, (1) EA	6.00	CF	$ 400.00	$ 2,000.00		$ 2,400.00
					REMOVE EXISTING IRON FENCE AND CURB AT ENTRANCE	40.00	LF	$ 500.00	$ 5,000.00		$ 5,500.00
					REMOVE EXISTING IRON FENCE AT 14TH STREET (EXIST. CURB TO REMAIN)	80.00	LF	$ 600.00	$ 6,000.00		$ 6,600.00
					REMOVE EXISTING 8'H IRON FENCE AT ASTORIA BOULEVARD	61.00	LF				$ -
					REMOVE EXISTING BRICK SITE WALL AT ENTRANCE INCL. FOUNDATION	105.00	SF				$ -
					REMOVE EXISTING PORCH AND 7' H BRICK ENCLOSURE	292.00	SF				$ -
					SAW CUT AND REMOVE EXISTING PAVEMENT	440.00	SF				$ -
					REMOVE EXISTING FOUNDATION WALL	19.00	CY				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					REMOVE EXISTING ENTRY VESTIBULE	1.00	EA				$ -
					REMOVE EXISTING ENTRY CONCRETE STAIR W/ RAILING	13.00	LF				$ -
					REMOVE EXISTING WINDOW SILL	11.00	LF				$ -
					REMOVE EXISTING PARTITIONS	239.00	LF				$ -
					REMOVE EXISTING DUMBWAITER	1.00	EA				$ -
					REMOVE EXIST. SHELVING AND BUILD UP BASE, TYP	76.00	LF				$ -
					REMOVE EXIST. WOOD CAP AND FURREDOUT WALL	29.00	LF				$ -
					REMOVE EXISTING CMU WALL	600.00	SF				$ -
					REMOVE EXSITING BRICK INFILL AND INTERIOR FINISHES BELOW EXISTING WINDOW TO LEVEL OF EXISITNG STONE SILL	30.00	SF				$ -
					REMOVE EXISTING MOLDING	35.00	LF				$ -
					PROTECT EXISTING MURAL ART WITH CANVAS COVERING SECURED TO EXISTING WALL UNTIL REMOVAL BY OTHERS	100.00	SF				$ -
					REMOVE EXIST VINYL TILE AND BASE	1,140.00	SF				$ -
					REMOVE EXIST CARPET TILE AND BASE	3,744.00	SF				$ -
					REMOVE EXISTING RUBBER FLOOR AND WALL BASE	545.00	SF				$ -
					REMOVE EXISTING WOOD SHELVING AT FIRST FLOOR	355.00	LF				$ -
					REMOVE EXISTING HANGING RODS	10.00	EA				$ -
					REMOVE EXIST. FLOORING (TYPE NOT SPECIFIED; SEE DM-100/DET.1,2)	4,895.00	SF				$ -
					REMOVE TILE FLOORING (TOILETS)	260.50	SF				$ -
					REMOVE TILE WAINSCOTING	312.40	SF				$ -
					REMOVE EXIST. PLASTERING ON CEILING	1,275.00	SF				$ -
					REMOVE EXIST. RUBBER TREADS AND FLOORING THROUGHOUT STAIR A	336.00	SF				$ -
					REMOVE EXIST. HANDRAILS	14.00	LF				$ -
					REMOVE EXIST. CHAIN LINK ENCLOSURE AND GATE	20.00	LF				$ -
					SAW CUT & REMOVE EXIST. SLAB FOR UNDERSLAB PIPING IN THE BASEMENT (113 LF)	113.00	SF				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					SAW CUT & REMOVE EXIST. SLAB FOR 24"X24" HOUSE TRAP PIT	4.00	SF				$ -
					REMOVE EXISTING FLAG POLE	1.00	EA				$ -
					REMOVE EXISTING PLASTER WALL ENCLOSURE	352.00	SF				$ -
					REMOVE EXISTING HANDRAIL AT ATTIC	55.00	SF				$ -
					REMOVE STEEL LADDER AND ENCLOSURE	1.00	EA				$ -
					REMOVE EXSITING GLAZED ENCLOSURE	27.00	LF				$ -
					REMOVE EXISTING FACE OF SHAFT TO FACE OF EXISTING BRICK CHIMENY	12.00	LF				$ -
					REMOVE EXISTING RAIN LEADER	23.00	LF				$ -
					REMOVE EXISTING ROOFING AT ENTRY PORCH AT ENTRY	85.00	SF				$ -
					REMOVE PORTION OF EXISTING SLATE AND SALVAGE FOR REUSE	46.00	SF				$ -
					REMOVE EXISTING HM EXTERIOR DOOR	4.00	EA				$ -
					REMOVE EXISTING ALUM./ GLASS ENTRY DOOR AND STOREFRONT	1.00	EA				$ -
					REMOVE EXISTING HM INTERIOR DOOR	19.00	EA				$ -
					REMOVE EXISTING WINDOWS INCLUDING METAL PANEL AND WINDOW GUARD - 3X9., 3X5, 4X4.5, 6X4	15.00	EA				$ -
					REMOVE EXISTING WINDOWS INCLUDING METAL PANEL AND WINDOW GUARD - 10'-8" X 9', 10X4	12.00	EA				$ -
					REMOVE EXISTING LOUVER - 7'X3'	13.00	EA				$ -
					REMOVE EXISTING FURNITURE	100.00	EA				$ -
					ENLARGE EXISTING DOOR OPENING IN AN INTERIOR MASONRY WALL (ON 4"H AND 4"W)	21.00	LF				$ -
					SAW CUT/REMOVE/CART BASEMENT SLAB TO UNDERPIN EXISTING FOUNDATION WALL ALONG AXIS F	24.00	CF				$ -
					REMOVE EXITING CONCRETE SLAB AND HANGER RODS AT MEZZANINE	600.00	SF				$ -
					REMOVE EXISTING SILLS & PLASTER SURROUND AT EXISTING WINDOW THROUGHOUT	160.00	LF				$ -
					SAW CUT/CART BASEMENT SLAB FOR NEW SEWAGE PIPING, 2'WX110'L	110.00	CF				$ -
					LOADING AND TRUCKING, HAND LOAD	120.00	CY				$ -
					REMOVE EXISTING CURB	155.00	LF				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					REMOVE EXISTING DRYWELL	1.00	EA				$ -
					REMOVE EXISTING BIKERACK	1.00	EA				$ -
					NEW OPENING IN EXISTING EXTERIOR MASONRY WALL	272.00	SF				$ -
					NEW OPENING IN THE BASEMENT MASONRY WALL, 6'6"X7'8H	49.80	SF				$ -
					REMOVE EXISTING BRICK INFILL AND INTERIOR FINISHES BELOW EXIST. WINDOW	36.00	SF				$ -
					PROVIDE OPENING FOR NEW DOOR IN AN INTERIOR MASONRY WALL (3'-0"X7'-0"H)	23.00	SF				$ -
			02 80 13 Incidential Asbestos Abaement								$ -
					INCLUDED IN CONTRACT ALLOWANCE						$ -
			02 82 13 Asbestos Abatement								$ -
					ASBESTOS ABATEMENT - WALL PLASTER 2ND LEVEL (BROWN) AND ASSOCIATED WALL PLASTER 1ST LAYER (WHITE)	560.00	SF	$ 9,000.00	$ 38,000.00		$ 47,000.00
					ASBESTOS ABATEMENT CEILING PLASTER 2ND LAYER (BROWN) AND ASSOCIATED CEILING PLASTER 1ST LAYER (WHITE)	550.00	SF	$ 9,000.00	$ 38,000.00		$ 47,000.00
			02 83 19 Lead-Based Paint Remediation					$ 15,000.00	$ 25,000.00		$ 40,000.00
					LEAD BASED PAINT REMEDITION - WALL PLASTER (YELLOW)	8,430.00	SF	$ 12,000.00	$ 168,600.00		$ 180,600.00
					LEAD BASED PAINT REMEDITION - CEILING PLASTER, CEILING BEAM PLASTER (WHITE)	4,321.00	SF	$ 6,000.00	$ 86,420.00		$ 92,420.00
					LEAD BASED PAINT REMEDITION - WALL PLASTER (BEIGE)	100.00	SF		$ 2,000.00		$ 2,000.00
					LEAD BASED PAINT REMEDIATION - SHELVING WOOD (BROWN)	150.00	SF		$ 3,000.00		$ 3,000.00
					LEAD BASED PAINT REMEDIATION - DUMB WAITER DOOR WOOD (YELLOW)	6.00	SF		$ 250.00		$ 250.00
					LEAD BASED PAINT REMEDIATION - DUMB WAITER DOOR FRAME WOOD (YELLOW)	20.00	SF	$ 2,000.00	$ 850.00		$ 2,850.00
					LEAD BASED PAINT REMEDIATION - WALL CONCRETE (WHITE)	320.00	SF		$ 8,000.00		$ 8,000.00
					LEAD BASED PAINT REMEDIATION - CEILING CONCRETE (WHITE)	510.00	SF	$ 2,000.00	$ 12,750.00		$ 14,750.00
					LEAD BASED PAINT REMEDIATION - WALL CONCRETE (YELLOW)	595.00	SF	$ 2,000.00	$ 11,900.00		$ 13,900.00
					LEAD BASED PAINT REMEDIATION - HVAC SUPPORT METAL (YELLOW)	30.00	SF		$ 850.00		$ 850.00
					LEAD BASED PAINT REMEDIATION - VENT COVER METAL (BEIGE)	2.00	SF		$ 60.00		$ 60.00
					LEAD BASED PAINT REMEDIATION - ELECTRICAL PANEL METAL (BEIGE)	15.00	SF		$ 400.00		$ 400.00

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					LEAD BASED PAINT REMEDITION - CEILING PLASTER (BEIGE)	4.00	SF		$ 250.00		$ 250.00
					LEAD BASED PAINT REMEDITION - STEEL COLUMN METAL (YELLOW)	80.00	SF		$ 2,500.00		$ 2,500.00
					LEAD BASED PAINT REMEDIATION - CEILING HEADER PLASTER (WHITE)	120.00	SF	$ 2,000.00	$ 3,500.00		$ 5,500.00
					LEAD BASED PAINT REMEDIATION - STRINGER METAL (BLACK)	80.00	SF		$ 2,500.00		$ 2,500.00
					LEAD BASED PAINT REMEDIATION - STAIR RISER METAL (BLACK)	120.00	SF		$ 3,500.00		$ 3,500.00
					LEAD BASED PAINT REMEDIATION - POST METAL (BLACK)	36.00	SF		$ 612.00		$ 612.00
					LEAD BASED PAINT REMEDIATIOBN - BALUSTER METAL (BLACK)	40.00	SF		$ 680.00		$ 680.00
					LEAD BASED PAINT REMEDIATION - HAND RAIL SUPPORT METAL (BLACK)	10.00	SF	$ 2,000.00	$ 200.00		$ 2,200.00
		copy above cell and insert copied cell above the row									
					SUB TOTAL			**$ 142,900.00**	**$ 924,822.00**		**$ 1,067,722.00**
		DIVISION 03 - CONCRETE									
			03 15 00 Concrete Accessories								$ -
					Included with 03 30 00						$ -
			03 30 00 Cast-in-Place Concrete					$ 140,000.00	$ 475,000.00		$ 615,000.00
					REPAIR BASEMENT CONCRETE SLAB AFTER 4" DIA SEWER INSTALLATION	220.00	SF				$ -
					MISC. CONCRETE PATCHING AFTER OTHER TRADES, MULTIPLE LOCATIONS	10.00	EA				$ -
					PROVIDE ADDITIONAL PROBE FOR FOOTING F10	1.00	EA				$ -
					CORE DRILL EXIST. FOUNDATION FOR NEW STORM AND SANITARY DRAINAGE (4" DIA, 6"DIA)	2.00	EA				$ -
					PROVIDE NEW 6" THICK REINFORCED SLAB ON GRADE AT AREA OF THE UNDERPINNING ALONG AXIS F, DOWELED TO EXIST. BASEMENT SLAB, HILTI HY270 1/2"DIA@O.C.	113.00	SF				$ -
					NEW CONCRETE STEP AT ELEVATOR MACHINE ROOM	0.30	CY				$ -
					PROVIDE EQUIPMENT PAD, 4" THICK (WATER HEATER)	8.00	SF				$ -
					REINFORCED CONCRETE 8", 10" THK RETAINING WALL AT STAIR AREA (fc=3,000 psi)	49.00	CY				$ -
					NEW 6" THK REINFORCED CONCRETE SLAB ON GRADE AT STAIR AREA	550.00	SF				$ -
					EXISTING PIT TO BE FILLED WITH NEW CONCRETE, fc'=4,000 psi	5.50	CY				$ -
					REINFORCED CONCRETE WALL FOOTINGS	13.00	CY				$ -
					EXISTING OPENING TO BE FILLED WITH NEW CONCRETE, fc'=4,000 psi (AXIS F)	3.30	CY				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					CONCRETE INFILL IN EXISTING BOILER PIT	2.41	CY				$ -
					INFILL EXISTING WATER SHUT	1.00	LOC				$ -
					NEW 12" THK REINFORCED CAST IN PLACE CONCRETE ELEVATOR PIT - 4' D (fc=5,000 psi)	6.00	CY				$ -
					NEW REINFORCED CONCRETE UNDERPINNING 24" W X 48" H. - 41 LF (fc=5,000 psi)	25.00	CY				$ -
					NEW CONCRETE FREESTANDING WALL AT ENTRANCE VESTIBULE	84.00	SF				$ -
					8" W X 36"H REINFORCED CONCRETE GUARDRAIL (LOW WALL) AT NEW STAIRS (SEE A601); (fc=3,000 psi)	0.59	CY				$ -
					ARCHITECTURAL CONCRETE RETAINING WALL	7.10	CY				$ -
					CONCRETE RETAINING WALL AT ENTRANCE	1.70	CY				$ -
					CONCRETE SEAT WALL AT ENTRANCE	5.20	CY				$ -
					CONCRETE EMBEDED LANDSCAPE WALL WITH FOOTING	30.00	CY				$ -
					CONCRETE FOOTING FOR SS PLANTER, 17"WX3'D, CONT. (DWG L600/7))	17.94	CY				$ -
					NEW 10" THK REINFORCED CAST IN PLACE CONCRETE PIT, 24"X24", FOR NEW HOUSE TRAPS (4' D; fc=5,000 psi)	0.50	CY				$ -
			03 35 43 Polished Concrete Finishing					$ 15,000.00	$ 30,000.00		$ 45,000.00
					REINFORCED 3" THK LIGHT WEIGHT CONCRETE SLAB (fc=4,000 psi) ON 2" MTL DECK AT NEW STAIRS	213.20	SF				$ -
					REINFORCED 4" THK LIGHT WEIGHT CONCRETE SLAB (fc=4,000 psi) ON 2" MTL DECK AT NEW STAIRS	180.00	SF				$ -
					REINFORCED LIGHT WEIGHT CONCRETE STEPS (fc=4,000 psi) OVER 2" MTL DECK AT NEW STAIRS (14 RISERS)	104.30	SF				$ -
					REINFORCED 3" THK LIGHT WEIGHT CONCRETE SLAB (fc=4,000 psi) (ON 2" MTL DECK AT MEZZANINE)	745.00	SF				$ -
			03 54 16 Hydraulic Cement Underlayment								$ -
					PROVIDE SLAB LEVELING AFTER DEMO WORK	6,620.00	SF	$ 12,000.00	$ 26,000.00		$ 38,000.00
					SUPPORT AND GROUT AT EXISTING MASONRY WALL FOR MOVABLE PARTITION	4.00	EA	$ 500.00	$ 1,500.00		$ 2,000.00
		copy above cell and insert copied cell above the row									
					SUB TOTAL			**$ 167,500.00**	**$ 532,500.00**		**$ 700,000.00**
		DIVISION 04 - MASONRY									
			04 20 00 Unit Masonry					$ 40,000.00	$ 80,000.00		$ 120,000.00
					PATCH AND REPAIR EXTERIOR MASONRY WALL AFTER WINDOW REPLACEMENT	803.02	LF				$ -
					PATCH AND REPAIR INTERIOR MASONRY WALL AT NEW OPENINGS	182.00	SF				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					PROVIDE ADDITIONAL PROBE ON CELLAR WALL FOR NEW DUCT OPENING	1.00	EA				$ -
		copy above cell and insert copied cell above the row									
					SUB TOTAL			**$ 40,000.00**	**$ 80,000.00**		**$ 120,000.00**
		DIVISION 05 - METALS									
			05 12 00 Structural Steel Framing					$ 30,000.00	$ 60,000.00	$ 40,000.00	$ 130,000.00
					NEW LINTEL FOR OPENING IN BRICK WALL	32.00	LF		$ 36,307.00		$ 36,307.00
					PROVIDE NEW STRUCTURAL STEEL:						$ -
					FOR MEZZ AND ROOF	30,610.00	LB	$ 40,578.00	$ 96,423.00		$ 137,001.00
					AT EXISTING BUILDING	1,950.00	LB	$ 33,737.00	$ 28,809.00		$ 62,546.00
					MOMENT CONNECTIONS	29.00	EA		$ 11,537.00		$ 11,537.00
					ATTIC LIGHTING SUPPORT POLE (2-3/4" DIA, 8'H)	10.00	EA		$ 3,500.00		$ 3,500.00
					MISCELLANEOUS METALS	500.00	LB		$ 10,000.00		$ 10,000.00
			05 12 13 Architecturally-Exposed Structural Steel								$ -
					ROD-HANGER - H1, 1" DIA A36 GRADE	32.00	LF		$ 3,000.00		$ 3,000.00
			05 31 00 Steel Decking					$ 10,000.00	$ 22,000.00		$ 32,000.00
					2" THICK, 20 GAUGE METAL DECK AT MEZZANINE	745.00	SF				$ -
					2" THICK, 20 GAUGE METAL DECK AT STAIR	275.00	SF				$ -
					3" THICK, 20 GAUGE METAL DECK AT ROOF	410.00	SF				$ -
			05 40 00 Cold-Formed Metal Framing					$ 80,000.00	$ 100,000.00		$ 180,000.00
					FOR FAÇADE SUPPORT	10,365.00	LB				$ -
			05 50 00 Metal Fabrications					$ 15,000.00	$ 42,000.00		$ 57,000.00
					NEW LADDER TO ELEVATOR SHAFT ROOF (1 EA)	10.00	LF				$ -
					STAINLESS STEEL RAILING AT ADDITION CONCRETE STAIR, POLISHED	30.00	LF				$ -
					NEW LADDER AT ATTIC	1.00	EA				$ -
					ALUM LADDER AT ROOF	1.00	EA				$ -
					L-SHAPED 1/2" 316L STAINLESS STEEL PANEL W/ UNI-DIRECTIONA LFINISH , TYP.	116.00	LF				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					SS PLANTER EDGE	115.00	LF				$ -
					PROPESED STAINLESS STEEL PLANTER AT STREET ENTRANCE, 1/2" 316L SS PANEL W UNI-DIRECTIONAL FINISH, TYP. (114 LF; WELDED 4'H, L-SHAPED, 8'W RIBS @6'O.C.WELDED; DWG L600(7))	570.00	SF				$ -
			05 52 13 Pipe and Tube Railings								$ -
					2" DIA HANDRAILING AT ATTIC PLATFORM	364.00	SF				$ -
			05 58 00 Formed Metal Fabrications								$ -
					INCLUDED IN 07.42.13.13	6.00	LF				$ -
			05 73 00 Decorative Metal Railings								$ -
					HANDRAILS IN FRONT OF PLANTER	6.00	LF		$ -		$ -
					RAILING AT BRIDGE: 5'0 3/8"H WITH HANDRAIL ATTACHED TO (2)1/2" LAMINATED GLASS GUARDRAIL, SS ANGLE CAP AT GLASS TOP, POLISHED	60.00	LF	$ 12,000.00	$ 20,000.00		$ 32,000.00
			05 73 13 Glazed Decorative Metal Railings								$ -
					Included above 05 73 00						$ -
		copy above cell and insert copied cell above the row									
					SUB TOTAL			**$ 221,315.00**	**$ 433,576.00**	**$ 40,000.00**	**$ 694,891.00**
		DIVISION 06 - WOOD, PLASTICS, COMPOSITES									
			06 10 00 Rough Carpentry					$ 100,000.00	$ 260,000.00		$ 360,000.00
					ROUGH CARPENTRY	3,198.00	SF				$ -
			06 16 00 Sheathing						$ -		$ -
					NEW MAINTENENCE PLATFORM AT ATTIC: 2'X4' FRAME ;	1,125.00	LF				$ -
					NEW MAINTENENCE PLATFORM AT ATTIC: 3/4" FIRE RATED PLAYWOOD	362.00	SF				$ -
					NEW PLYWOOD DECK AT BRIDGE: (2) 3/4" LAYERS PLAYWOOD	160.10	SF				$ -
					3/4" PLYWOOD DECK AT NEW ROOF ADDITION	626.00	SF				$ -
					PROVIDE NEW OPENING IN THE ROOF STRUCTURE, 1'11-1/2"WX 4'3-1/2"L	1.00	EA				$ -
					PROVIDE NEW OPENING 1'6"WX2'4"L IN EXIST. ATTIC JOIST SLAB ABOVE DUMBWAITER	1.00	EA				$ -
			06 41 16 Plastic-Laminate-Clad Architectural Cabinets					$ 150,000.00	$ 170,000.00		$ 320,000.00
					M01 - CHILDERN'S LIBRARIAN'S DESK AT CHILDREN'S STACKS	11.00	LF				$ -
					M04 - KITCHEN COUNTER, 2'-3" W WITH BASE CABINET AND BACKSPLASH AT KITCHEN COUNTER	10.00	LF				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					M09 - TEEN' LIBRARIAN'S DESK, 2'W	6.00	LF				$ -
					M11 - LIBRARIAN DESK AT ADULT AREA	15.00	LF				$ -
					B4-WOOD BASE,PAINTED	110.00	LF				$ -
			06 61 16 Solid Surfacing Fabrications					$ 30,000.00	$ 18,000.00		$ 48,000.00
					M05 - LIBRARY SHELVING AT CHILDREN'S STACKS	120.00	LF				$ -
					M12 - COUNTER, 2'WAT ADULT AREA	18.25	LF				$ -
		copy above cell and insert copied cell above the row									
					SUB TOTAL			**$ 280,000.00**	**$ 448,000.00**		**$ 728,000.00**
		DIVISION 07 - THERMAL AND MOISTURE PROTECTION									
			07 11 13 Bituminous Dampproofing					$ 4,000.00	$ 7,500.00		$ 11,500.00
					INCLUDED IN 07 13 26						$ -
			07 13 26 Self-Adhering Sheet Waterproofing								$ -
					NEW ADDITION FOUNDATION WATERPROOFING	406.00	SF	$ 5,000.00	$ 5,000.00		$ 10,000.00
			07 16 16 Crystalline Waterproofing								$ -
					NEW ADDITION FOUNDATION WATERPROOFING - CRYSTALLINE WATERPROOFING	350.00	SF				$ -
			07 21 00 Thermal Insulation								$ -
					ADDITIONAL THERMAL AND MOISTURE PROTECTION AT SUSTAINABLE ROOFING ZONE	55.00	SF				$ -
			07 27 26 Fluid-Applied Membrane Air Barriers								$ -
					NEW ROOFING SYSTEM - FLUID-APPLIED MEMBRANE AIR BARRIERS	626.00	SF				$ -
			07 31 26 Slate Shingles								$ -
					REINSTALL SALVAGED PORTION OF EXISTING SLATE AT ROOF TRANSITION	46.00	SF				$ -
			07 42 13.13 Formed Metal Wall Panels					$ 100,000.00	$ 80,000.00		$ 180,000.00
					M1, METAL WALL PANELS, ANODIZED 0.040 ALUM. COLOR XINC II	795.00	SF				$ -
					TYPE M2 & M2A, OPM SERIES INTERLOCKING, ANODIZED 0.040 ALUM COLOR BLACK MATT	518.00	SF				$ -
					TYPE M3, 3 MM PREFINISHED PLATE ALUMINUM	148.00	SF				$ -
					PRE-FINISHED ALUMINUM SOFFIT	12.00	LF				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
			07 42 13.16 Metal Plate Wall Panels								$ -
					INCLUDED IN 07 42 13 13						$ -
			07 46 46 Fiber-Cement Siding								$ -
					INCLUDED IN 08 51 13						$ -
			07 52 16 Styrene-Butadiene-Styrene Modified Bituminous Membrane Roofing					$ 20,000.00	$ 50,000.00		$ 70,000.00
					NEW ROOFING SYSTEM - POLYSTERINE INSULATION, 5" THK	626.00	SF				$ -
					NEW ROOFING SYSTEM - MINERAL BOARD INSULATION, 3" THK	626.00	SF				$ -
					NEW ADDITION FOUNDATION INSULATION, 2" EXTRUDED POLY, R10	406.00	SF				$ -
					NEW ROOF SPLASH PAD, 2'X2' (FROM ELEV. SHAFT)	4.00	SF				$ -
					RECYCLED RUBBER ROOF PROTECTION MATS, 2'X2'	36.00	SF				$ -
			07 62 00 Sheet Metal Flashing and Trim					$ 10,000.00	$ 20,000.00		$ 30,000.00
					METAL FLASHING OF DRAIN GUTTER	12.00	LF				$ -
					METAL COPING	25.00	LF				$ -
					NEW METAL CRICKET (FLAT SHEET METAL ROOFING, 20 OZ)	37.00	SF				$ -
					NEW ROOF SCUPPER, ALUMINUM, MILL FINISH, 0.050" THICK	1.00	EA				$ -
					PROVIDE NEW METAL FLUSHING AT SLAT ROOF TO NEW ROOF TRANSITION	54.00	SF				$ -
			07 72 73 Vegetated Roof Systems					$ 12,000.00	$ 18,000.00		$ 30,000.00
					VEGETATED TRAYS 24X12 FOR SUSTAINABLE ROOFING ZON; 24"X12"	27.00	EA				$ -
			07 81 00 Applied Fireproofing					$ 35,000.00	$ 85,000.00		$ 120,000.00
					NEW SPRAY-ON FIREPROOFING ON STRUCTURAL STEEL, 2HR	1,163.00	SF				$ -
					NEW SPRAY-ON FIREPROOFING ON STRUCTURAL STEEL, 1HR	100.00	SF				$ -
					NEW SPRAY-ON FIREPROOFING ON STRUCTURAL STEEL, 3/4HR	120.00	SF				$ -
			07 84 13 Penetration Firestopping								$ -
					NEW FIRESTOPPING / SMOKESEALS THROUGHOUT	1,200.00	LF	$ 2,000.00	$ 10,000.00		$ 12,000.00

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
			07 92 00 Joint Sealants								$ -
					NEW SEALANT	460.00	LF	$ 3,500.00	$ 5,000.00		$ 8,500.00
			07 95 00 Expansion Control								$ -
					EXPANSION JOINT	21.00	LF	$ 200.00	$ 1,500.00		$ 1,700.00
		copy above cell and insert copied cell above the row									
					SUB TOTAL			**$ 191,700.00**	**$ 282,000.00**		**$ 473,700.00**
		DIVISION 08 - OPENINGS									
			08 11 13 Hollow Metal Doors and Frames					$ 80,000.00	$ 70,000.00		$ 150,000.00
					EX-1 - 3'5"X7'H - NEW INSULATED DOOR IN EXISTING FRAME, THERMALLY BROKEN SILL	1.00	EA				$ -
					EX-2 - 3'X7'H WITH 2'-1.5" X7'H LIGHTSIDE, ALUM./GLASS DOOR, THERMALLY BROKEN ALUM. FRAME, HW SET #11, PANIC HARDWARE CONNECTED TO FA SYSTEM; CARDREADER, EGRESS ALARM, MAGNETIC DOOR CONTACR	1.00	EA				$ -
					EX-3 - 3'6X7'H - NEW DOOR IN EXIST FRAME, EGRESS ALARM, CARD READER ACCESS BOTH SIDES, PANIC HARDWARE, CHEXIT	1.00	EA				$ -
					01 - 3'X7'H, HM, HM FRAME, 1HR, HW SET #1, CARD READER ACCESS, 1 HR RATED	1.00	EA				$ -
					02 - 3'X7'H, EXISTING DOOR IN EXIST. FRAME TO REMAIN, NO WORK INDICATED						$ -
					03 - 3'X7'H, HM, HM FRAME, HW SET #2, ACOUSTIC SEAL	1.00	EA				$ -
					04, 05,06 - 3'X6'8"H, HM, HM FRAME, HW SET #4, PAINTED, 3/4" DOOR UNDERCUT	3.00	EA				$ -
					07, 08 - 3'X6'8"H, HM, HM FRAME,, HW SET #2, ACOUSTIC SEAL	2.00	EA				$ -
					09 - 3'X6'8"H, HM, HM FRAME, HW SET #1,CARD READER ACCESS	1.00	EA				$ -
					010 - 3'X6'8"H, HM, HM FRAME, HW SET #6	1.00	EA				$ -
					011 - 3'X7'H, HM, HM FRAME, HW SET #2, 1 HR RATED	1.00	EA				$ -
					012 - 2'X7'H, HM, EXIST. FRAME, HW SET #2	1.00	EA				$ -
					012A - 3'X7'H, HM, EXIST. FRAME, 1.5HR; HW SET #13; CARD READER, HOLD OPEN CHEXIT	1.00	EA				$ -
					013 - 2'6"'X7'H, HM, HM FRAME, HW SET #2; 1 HR, ACOUSTIC SEAL	1.00	EA				$ -
					014 - 2'11"'X6'8"H, HM, HM FRAME, HW SET #7; 1.5 HR, ACOUSTIC SEAL, CARD READER ACCESS	2.00	EA				$ -
					015 - 3'6X6'8, HM, HM FARME, HW SET #8, ACOUSTIC SEALS, CARD READER ACCESS ELECTRONIC STIKE, SELF CLOSING, MAGNETIC DOOR CONTACT	1.00	EA				$ -
					016 - 3'X6'8"H, HM, HM FRAME, HW SET #3	1.00	EA				$ -
					018 - 3'X6'8"H, HM, HM FRAME, 1.5 HR, HW SET #16	1.00	EA				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					101 - 3'X6'8"H, GL, ALUM FRAME, HW SET #1, CARD READER ACCESS	1.00	EA				$ -
					102 - 2'10"X6'8"H, HM, HM FRAME, HW SET #3, SELF CLOSING	1.00	EA				$ -
					103 - 3'X6'8"H, HM, HM FRAME, HW SET #6	1.00	EA				$ -
					104 - 3'X6'8"H, HM, HM FRAME, HW SET #4, SELF CLOSING	1.00	EA				$ -
					105 - 3'X6'8"H, HM, HM FRAME, HW SET #4a	1.00	EA				$ -
					106 - 2'8"X7'H, HM, EXIST. FRAME, HW SET #2, PAINTED	1.00	EA				$ -
					107 - (2)3'X7'H, GL, DOUBLE DOOR, ALUM. FRAME, HW SET #13	1.00	EA				$ -
					107A - 3'X7'H, HM, EXIST. FRAME, HW SET #10; 1HR	1.00	EA				$ -
					108 - (2)2'10"X7'H, GL, DOUBLE DOOR, ALUM. FRAME, THERMALLY BROKEN ALUM. FRAME, CARDREADER, MAGNETIC DOOR CONTACR; HW SET #12	1.00	EA	$ 14,000.00	$ 15,000.00		$ 29,000.00
					M01 - 3'x6'-8"-HM-HM FRAME, 1.5HR, SET #14	1.00	EA				$ -
					ACCESS DOOR, 16X16	1.00	EA				$ -
			08 41 13 Aluminum-Framed Entrances and Storefronts					$ 30,000.00	$ 25,000.00		$ 55,000.00
					M01A - 3'x6'8", GL, ALUM FRAME, Set #15	1.00	EA				$ -
					W1 - 6'2"X4'4"H, TRANSOM, FIXED, ALUM FRAME, GL-2: 3/8"THICK TEMPERED GLASS	26.00	SF				$ -
					W2 - 1'-7 1/2"X6'8"H, SIDELIGHT, FIXED, ALUM FRAME, GL-2: 3/8"THICK TEMPERED GLASS	10.50	SF				$ -
					W3,W4 - BRIDGE GLASS RAILING, GL-1: 1/2"THICK +1/16"+1/2" LAMINATED GLASS IN ALUMINUM SHOE, 5'5"H	290.00	SF				$ -
					W5 - 2'8 1/2"X3'11 1/2"H, SIDELIGHT, FIXED, ALUM FRAME, GL-2: 3/8"THICK TEMPERED GLASS	14.42	SF				$ -
					W06 - 7'7"X6'-1/2"H, FIXED, ALL-GLAZED STOREFRONT, GL-2: 3/8"THICK TEMPERED GLASS	46.06	SF				$ -
					W07- 7'4"X6'-1/2"H, FIXED, ALL-GLAZED STOREFRONT, GL-2: 3/8"THICK TEMPERED GLASS	42.85	SF				$ -
			08 44 13 Glazed Aluminum Curtain Walls					$ 250,000.00	$ 200,000.00		$ 450,000.00
					ALUMINUM / GLASS STOREFRONT INCL. SOLAR SHADING AT VESTIBULE - VIRACON VE1-2M GLAZING SYSTEM, INCLUDING METAL FRAMING SHOWN BELOW:	610.00	SF				$ -
					METAL SUPPORT - BT-7"X3"X1"X3/4"; 7" D, 3'W, 1" WEB AND 3/4" FLANGE TYP. (19'4"L/EA) - INCLUDED ABOVE	9.00	EA				$ -
					METAL SUPPORT - BT-9 7/8"X3"X1"X3/4" TYP. - M2 - BUILD UP STEEL FOR GLAZING - INCLUDED ABOVE	1.00	EA				$ -
					METAL SUPPORT - B-BOX - 7"X4"X1"X3/4" TYP., M4 - BUILD UP STEEL FOR GLAZING - INCLUDED ABOVE	1.00	EA				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
			08 51 13 Aluminum Windows					$ 110,000.00	$ 98,000.00		$ 208,000.00
					NEW WINDOWS: 3-1/2" STANDARD COLOR ANODIZED ALUM. FRAME/POLYAMIDE THERMAL BARRIER, 1' INSUL. GLASS, INSECT SCREEN, BY ARCADIA INC. AS BELOW:	1,139.00	SF				$ -
					B01 - 3'-11"X3'7.5"; FIXED	14.20	SF				$ -
					B02 - 3'-11"X6'7"; FIXED	26.06	SF				$ -
					B03, B05 - 11'X4'5"H; FIXED	103.12	SF				$ -
					B04 - 4'5"X6'6"; FIXED	28.67	SF				$ -
					B06-B010 - 3'6"X5'9 1/2"H; HOOPER LOWER CASE	101.35	SF				$ -
					B11 -2'10"X4'1"; HOOPER	11.56	SF				$ -
					B12 -2'10"X3'5-1/2"; HOOPER	9.79	SF				$ -
					B13 - 2'10"X3'5"; HOOPER	8.26	SF				$ -
					F01 (2AE), F11 - 10'10" X 9'4 1/2"H; (4)HOOPERS, (2)FIXED; (2)CENTRAL SPANDREL PANELS	305.40	SF				$ -
					F02 - 11' X 9'4 1/2"H; (2)HOOPERS, (2)FIXED 6'X6'H; (1)FIXED 2'-1/2"X 3'3"H	102.40	SF				$ -
					F03, F04, F05 - 11' X 6'-3 1/2"H; (3)HOOPERS, (3)FIXED 3'6"X3'8"H	209.40	SF				$ -
					F06 - F10 - 3'6"X9'4 1/2"H	180.00	SF				$ -
					F12 - 11'8"X3'1 1/2"H	38.70	SF				$ -
			08 71 00 Door Hardware					$ 20,000.00	$ 15,000.00		$ 35,000.00
					EXIT DEVICES AND TRIM FOR EXIST DOORS, Von Duprin Chexit	4.00	EA				$ -
					DOOR OPERATORS AT ENTRANCE DOOR 108	1.00	SET				$ -
			08 80 00 Glazing								$ -
					COVERED UNDER SPEC SECTION 08 41 13, 08 44 13 & 08 51 13						$ -
					TYPE 0.6-FULLY GLAZED WALL	257.29	SF				$ -
			08 81 26 Interior Glass Glazing								$ -
					INCLUDED IN 08 11 13						$ -
			08 83 00 Mirrors					$ 8,000.00	$ 8,000.00		$ 16,000.00

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					MIRROR	5.00	SET				$ -
			08 91 19 Fixed Louvers					$ 10,000.00	$ 10,000.00		$ 20,000.00
					PRE-FINISHED ALUM LOUVER	1.00	LOC				$ -
		copy above cell and insert copied cell above the row									
					SUB TOTAL			**$ 522,000.00**	**$ 441,000.00**		**$ 963,000.00**
		DIVISION 09 - FINISHES									
			09 21 16 Gypsum Board Shaft Wall Assemblies					$ 80,000.00	$ 110,000.00		$ 190,000.00
					TYPE 0.1- STEEL STUD PARTITION, NON-RATED, 5/8" GWB EACH SIDE ON 3-5/8" MTL STUD, 3" ACOUSTICAL INSULATION	1,524.00	SF				$ -
					TYPE 1.1- STEEL STUD PARTITION, 1 HR, 5/8" GWB TYPE X EACH SIDE ON 3-5/8" MTL STUD	46.10	SF				$ -
					TYPE 0.4 - CAVITY WALL PARTITION, NON-RATED, 5/8" GWB EACH SIDE ON (2) 3-1/4" MTL STUD WITH SPACE PER PLAN, 3" ACOUSTIC BATT EACH SIDE	157.00	SF				$ -
					TYPE 0.5 - STAGGERED STEEL STUD ACOUSTICAL PARTITION, NON-RATED, (2) 5/8" GWB EACH SIDE, 3-5/8" MTL STUD, 3" ACOUSTIC BATT, NON RATED	176.20	SF				$ -
					TYPE 2.0 - STEEL STUD PARTITION, 2 HR, 5/8" GWB TYPE X EACH SIDE ON 3-5/8" MTL STUD	166.00	SF				$ -
					TYPE 2.1 - SHAFT WALL, 2HR, 1" CORE BOARD,MTL C-H STUD, (2) LAYER 5/8" TYPE X GWB	720.00	SF				$ -
					EX2 -FURRING CHANNEL ON EXISTING CONSTRUCTION-NON RATED,1 5/8" METAL STUD,ONE LAYER OF 5/8" GYPSUM BOARD	466.37	SF				$ -
					EX3-EXISTING TERRACOTTA BLOCK AND PLASTER FINISH	950.00	SF				$ -
			09 22 16 Non-Structural Metal Framing					$ 20,000.00	$ 35,000.00		$ 55,000.00
					TYPE 0.2, 0.2A -FURRING ON EXISTING CONDITION, NON-RATED, 5/8" GWB ONE SIDE ON-2 5/8" METAL STUDS	1,525.11	SF				$ -
					TYPE-0.3-PARTIAL HIGH WALL, 5/8" GWB EACH SIDE ON (2) 3-5/8" MTL, NON RATED	12.00	SF				$ -
			09 23 00 Gypsum Plastering					$ 25,000.00	$ 95,000.00		$ 120,000.00
					EX5- EXISTING BRICK WALL WITH PLASTER FINISH	254.22	SF				$ -
					C1 - CLEAN EXISTING PLASTER CLEAN	2,555.00	SF				$ -
					C3 - EXISTING PLASTER ON BEAMS REPAIR AND PATCH (SIDES AND UNDERSIDE OF THE STRUCTURE)	210.00	SF				$ -
					REPAIR EXISTING PLASTER ON WALL (WALL TYPE EX & EX1)	8,645.00	SF				$ -
					REPAIR EXISTING PLASTER ON WALL - STAIR A	1,060.00	SF				$ -
			09 29 00 Gypsum Board								$ -
					C2 - NEW GWB CEILING: 1-5/8" MTL STUD, 5/8" GWB	525.00	SF	$ 20,000.00	$ 50,000.00		$ 70,000.00

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					C4 - 2 LAYER TYPE 'X' 5/8 GWB	650.00	SF				$ -
					C5 -ACT	215.00	SF				$ -
					5/8 GWB CEILING AT NEW ROOF ADDITION (INKL. ELEVATOR SHFT BULKHEAD)	626.00	SF				$ -
					C7 - EXISTING GWB - PREPARE TO RECEIVE PAINT	1,882.00	SF				$ -
					C9-1/2 GWB ON RESILIENT CHANNELS	2,045.00	SF				$ -
			09 30 00 Tiling					$ 10,000.00	$ 20,000.00		$ 30,000.00
					T1 - CERAMIC TILE WALL COVERING (TOILETS)	42.00	SF				$ -
					T2 -PORCELAIN TILE (TOILETS)	311.00	SF				$ -
			09 51 13 Acoustical Panel Ceilings					$ 12,000.00	$ 14,000.00		$ 26,000.00
					C5 -ACT	215.00	SF				$ -
			09 54 23 Linear Metal Ceilings					$ 20,000.00	$ 22,000.00		$ 42,000.00
					C6- BENT ALUM PANEL	155.00	SF				$ -
					PRE-FINISHED METAL CLADDING (UNDERSIDE OF THE BRIDGE)	152.00	SF				$ -
			09 65 00 Resilient Flooring					$ 30,000.00	$ 22,000.00		$ 52,000.00
					SH1 - RUBBER SHEET FLOORING (ELEVATOR)	180.00	SF				$ -
					SH-2 - STAIR A FLOORING	357.00	SF				$ -
					LVT1 - VINYL TILE FLOORING	725.00	SF				$ -
					LVT1 - VINYL TILE FLOORING - PATTERN	1,434.00	SF				$ -
					LVT2 - VINYL TILE FLOORING	700.00	SF				$ -
					VCT-1-VINYL COMPOSITION TILE FLOORING	80.00	SF				$ -
			09 65 13 Resilient Base and Accessories					$ 1,200.00	$ 4,000.00		$ 5,200.00
					4" WALL BASE	1,265.00	LF				$ -
			09 67 23 Resinous Flooring					$ 2,500.00	$ 10,000.00		$ 12,500.00
					RF1 - RESINOUS FLOORING	230.00	SF				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
			09 68 13 Tile Carpeting					$ 20,000.00	$ 30,000.00		$ 50,000.00
					CT1 - 24X24 CARPET TILES FLOORING (READING ROOMS)	73.00	sy				$ -
					CT2 - 24X24 CARPET TILES FLOORING (MNDG. OFFICE, ADULT AREA)	299.00	sy				$ -
			09 91 00 Painting					$ 25,000.00	$ 115,000.00		$ 140,000.00
					SCRAPE/CLEAN, PRIME AND PAINT EXISTING BLACK STEEL FENCE (6'H)	710.00	SF				$ -
					PAINT NEW GWB WALLS / PARTITIONS	12,650.00	SF				$ -
					PANT NEW & EXISTING GWB / PLASTER CEILING	9,863.00	SF				$ -
					PATCH AND REPAIR EXISTING CEILING AFTER HVAC WORK	1.00	EA				$ -
					PAINT NEW DOORS AND FRAME	25.00	LEAF				$ -
					SCRAPE, PRIME AND RE-PAINT EXIST. WOOD RAILING @ STAIR A	269.00	SF				$ -
					MISC. PAINTING (FINISH TOUCH-UP)	306.00	SF				$ -
					PC - PAINTED CONCRETE	637.00	SY				$ -
					PIP CONCRETE, PAINTED	372.00	SF				$ -
		copy above cell and insert copied cell above the row									
					SUB TOTAL			**$ 265,700.00**	**$ 527,000.00**		**$ 792,700.00**
		DIVISION 10 - SPECIALTIES									
			10 11 00 Visual Display Units						$ -		$ -
					TACKABLE SURFACE IN CHILDREN'S READING ROOM	95.00	SF	$ 6,000.00	$ 2,500.00		$ 8,500.00
			10 14 00 Signage					$ 15,000.00	$ 15,000.00		$ 30,000.00
					EXTERIOR SIGNAGE	1.00	EA				$ -
					MURAL SIGNAGE INSTALLATION ONLY, PROVIDED BY OTHERS	1.00	EA				$ -
					INTERIOR SIGNAGE	120.00	EA				$ -
					PROPOSED BANNER SIGNAGE - 10'H	1.00	EA				$ -
			10 22 39 Folding Panel Partitions					$ 38,000.00	$ 20,000.00		$ 58,000.00
					FOLDING PARTITION AT MULTIPURPOSE ROOM - 10'H	260.00	SF				$ -
			10 28 13 Toilet Accessories					$ 10,000.00	$ 15,000.00		$ 25,000.00

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					GRAB BAR	5.00	SET				$ -
					SOAP DISPENSER (Kimberly Clark and SSS PER PROPRIETARY ITEMS LIST)	6.00	SET				$ -
					PAPER TOWEL DISPENSER (Kimberly Clark and SSS PER PROPRIETARY ITEMS LIST)	6.00	SET				$ -
					TOILET PAPER DISPENSER (Kimberly Clark and SSS PER PROPRIETARY ITEMS LIST)	5.00	SET				$ -
					TOILET SEAT DISPENSER	5.00	EA				$ -
					BABY CHANGING TABLE	2.00	EA				$ -
					SANITARY WASTE RECEPTACLE	5.00	EA				$ -
					HAND DRYER	5.00	EA				$ -
			10 44 00 Fire Protection Specialties								$ -
					FIRE EXTINGUISHER CABINET	3.00	EA	$ 1,500.00	$ 2,000.00		$ 3,500.00
			10 75 00 Flagpoles								$ -
					FLAGPOLE	1.00	EA	$ 5,000.00	$ 8,000.00		$ 13,000.00
		copy above cell and insert copied cell above the row									
					SUB TOTAL			**$ 75,500.00**	**$ 62,500.00**		**$ 138,000.00**
		DIVISION 11 - EQUIPMENT									
			11 30 13 Residential Appliances					$ 4,000.00	$ 1,000.00		$ 5,000.00
					30" REFRIGERATOR, Whirlpool 20 cu. ft. Top Freezer Refrigerator in White	1.00	EA				$ -
					MICROWAVE, COUNTERTOP, CUISINART 0.7 CF, 700-WATT	1.00	EA				$ -
			11 51 00 Library Equipment					$ 15,000.00	$ 5,000.00		$ 20,000.00
					SELFCHECK Equipment Book returns (at exterior application): Lyngsoe	1.00	EA				$ -
					SELFCHECK 1000 - FREE STANDING KIOSK INCL. SOFTWARE SUPPORT	3.00	EA				$ -
					RFID Gates - Wide Aisle (4 pedestals)	4.00	EA				$ -
		copy above cell and insert copied cell above the row									
					SUB TOTAL			**$ 19,000.00**	**$ 6,000.00**		**$ 25,000.00**
		DIVISION 12 - FURNISHINGS									
			12 24 13 Roller Window Shades					$ 4,000.00	$ 6,950.00		$ 10,950.00
					HAND ROLLER WINDOW SHADES	304.00	SF				$ -
			12 36 00 Countertops					$ 18,000.00	$ 35,000.00		$ 53,000.00

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					M02 - COUNTER, 2' W AT CHILDERN'S READING ROOM	17.00	LF				$ -
					M03 - COUNTER ON SHELVING AT CHILDERN'S READING ROOM	35.00	LF				$ -
					M06 - SHELVING TOP AT CHILDREN'S STACKS	30.00	LF				$ -
					M07, M08- COUNTER , 2'W AT ADULT AREA	19.00	LF				$ -
					M10 - COUNTER, 2'W AT TEEN	22.25	LF				$ -
			12 48 13.13 Entrance Floor Mats								$ -
					WALK OFF MATS	68.00	SF	$ 3,000.00	$ 2,000.00		$ 5,000.00
		copy above cell and insert copied cell above the row									
					SUB TOTAL			**$ 25,000.00**	**$ 43,950.00**		**$ 68,950.00**
		DIVISION 14 - CONVEYING EQUIPMENT									
			14 24 00 Hydraulic Elevators								$ -
					NEW ELEVATOR W/ TWO SIDE OPENING - 3 STOPS	1.00	EA	$ 190,000.00	$ 190,000.00		$ 380,000.00
		copy above cell and insert copied cell above the row									
					SUB TOTAL			**$ 190,000.00**	**$ 190,000.00**		**$ 380,000.00**
		DIVISION 22 - PLUMBING									
			22 05 00 Common Work Results for Plumbing					$ 20,000.00	$ 50,000.00		$ 70,000.00
					DEMO GAS METER	1.00	EA	$ 50.00	$ 100.00		$ 150.00
					DEMO WATER METER	1.00	EA	$ 50.00	$ 100.00		$ 150.00
					DEMO RUNNING TRAP	2.00	EA	$ 50.00	$ 100.00		$ 150.00
					DEMO GAS FIRED HEATER	1.00	EA	$ 50.00	$ 100.00		$ 150.00
					DEMO WATER CLOSET	4.00	EA	$ 50.00	$ 100.00		$ 150.00
					DEMO LAVATORY	4.00	EA	$ 50.00	$ 100.00		$ 150.00
					DEMO KITCHEN SINK	1.00	EA	$ 50.00	$ 100.00		$ 150.00
					DEMO GAS RANGE	1.00	EA	$ 50.00	$ 100.00		$ 150.00
					DEMO SERVICE SINK	1.00	EA	$ 50.00	$ 100.00		$ 150.00
					DEMO GAS, CW, HW PIPING	210.00	LF	$ 50.00	$ 100.00		$ 150.00
					DEMO UNDERGROUND PIPE < 2 1/2"	40.00	LF	$ 50.00	$ 100.00		$ 150.00
					DEMO UNDERGROUND PIPE >2 1/2"	250.00	LF	$ 50.00	$ 100.00		$ 150.00

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					DEMO PIPE < 2 1/2"	420.00	LF	$ 50.00	$ 100.00		$ 150.00
					EXISTING WATER HOUSE CONTROL VALVE, DOMESTIC WATER METER, SANITARY HOUSE TRAP IN WATER, METAL COVER TO BE REMOVED	1.00	EA	$ 50.00	$ 300.00		$ 350.00
					EXISTING UNDERGROUND PIPING IN WATER PIT AND VALVES, METAL COVER TO BE REMOVED	1.00	EA	$ 50.00	$ 300.00		$ 350.00
					EXISTING DOWNSPOUT TO BE REMOVED	2.00	EA	$ 50.00	$ 300.00		$ 350.00
					EXISTING HOSE BIBB TO BE REMOVED	2.00	EA	$ 50.00	$ 300.00		$ 350.00
					REMOVE EXISTING AREA DRAIN	1.00	EA	$ 50.00	$ 300.00		$ 350.00
					REPLACE GRATE FROM EXISTING AREA DRAIN	2.00	EA	$ 50.00	$ 300.00		$ 350.00
					DISCONNECT AND CAP EXISTING	12.00	EA	$ 50.00	$ 300.00		$ 350.00
					NEW PIPE CONNECTIONS	8.00	EA	$ 800.00	$ 1,300.00		$ 2,100.00
					EXPANSION TANK WITH HOOKUP, 2.1 GAL (ET-1, ET-2)	2.00	EA	$ 300.00	$ 500.00		$ 800.00
					DRILLING (NE FIXTURE LAYOUT)	6.00	EA		$ 13,000.00		$ 13,000.00
					HW CIRCULATING PUMP (CP-1, CP-2) 1 GPM, 1/4 HP	2.00	EA	$ 1,000.00	$ 400.00		$ 1,400.00
					SUMP PUMP (SP-1) 50 GPM, 1.0 HP	2.00	EA	$ 8,000.00	$ 2,500.00		$ 10,500.00
					POTABLE WATER DISINFECTION	1.00	EA	$ 500.00	$ 3,000.00		$ 3,500.00
					EQUIPMENT HANDLING & MATERIAL DISTRIBUTION	1.00	EA		$ 5,000.00		$ 5,000.00
			22 05 23 General-Duty Valves for Plumbing Piping								$ -
					INCLUDED IN 22 11 16			$ 1,500.00	$ 2,500.00		$ 4,000.00
			22 05 29 Hangers and Supports for Plumbing Piping and Equipment								$ -
					4" HUBLESS PIPE VERTICAL SUPPORT PER DETAIL	11.00	LF	$ 500.00	$ 1,500.00		$ 2,000.00
			22 05 53 Identification for Plumbing Piping and Equipment								$ -
					SYSTEM ID, LABELS AND COLOR CODING	1.00	EA	$ 500.00	$ 1,500.00		$ 2,000.00
			22 07 00 Plumbing Insulation								$ -
					1" THK FG INSULATION	610.00	LF			$ 8,000.00	$ 8,000.00
			22 08 00 Commissioning of Plumbing								$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					INCLUDED IN GENERAL REQUIREMENTS				$ 2,500.00		$ 2,500.00
			22 11 13 Facility Water Distribution Piping								$ -
					NEW WATER SERVICE CONNECTIONS W/ CURB VALVE	1.00	EA				$ -
			22 11 16 Domestic Water Piping								$ -
					2" PIPE (CW, HW) TYPE 'L' COPPER	40.00	LF	$ 1,550.00	$ 3,200.00		$ 4,750.00
					1-1/2" PIPE (CW, HW) TYPE 'L' COPPER	50.00	LF	$ 500.00	$ 1,500.00		$ 2,000.00
					1" PIPE (CW, HW) TYPE 'L' COPPER	100.00	LF	$ 1,200.00	$ 1,000.00		$ 2,200.00
					3/4" PIPE (CW, HW) TYPE 'L' COPPER	370.00	LF	$ 3,000.00	$ 16,000.00		$ 19,000.00
					1/2" PIPE (CW, HW) TYPE 'L' COPPER	50.00	LF	$ 500.00	$ 3,000.00		$ 3,500.00
					FIXTURES ROUGH-IN	18.00	EA	$ 10,000.00	$ 35,000.00		$ 45,000.00
					ELECTRIC WATER HEATER PIPING HOOK-UP	2.00	EA	$ 500.00	$ 2,300.00		$ 2,800.00
			22 11 19 Domestic Water Piping Specialties								$ -
					BALANCING VALVES	6.00	EA	$ 800.00	$ 1,500.00		$ 2,300.00
					NO HUB PIPE SUPPORT FOR FD	8.00	EA	$ 300.00	$ 1,000.00		$ 1,300.00
					ELECTRONIC TRAP PRIMER WITH FLOOR DRAIN CONNECTION	2.00	EA	$ 2,000.00	$ 2,500.00		$ 4,500.00
					4" WATER SUPPLY ELECTROMAGNETIC METER WITH HOOKUP, FLANGED	1.00	EA	$ 3,000.00	$ 2,500.00		$ 5,500.00
					2" RPZ	1.00	EA	$ 2,000.00	$ 1,500.00		$ 3,500.00
					2" MICV	1.00	EA	$ 500.00	$ 500.00		$ 1,000.00
					2" GATE HOUSE CONTROL VALVE	1.00	EA	$ 500.00	$ 500.00		$ 1,000.00
					2" CAPPED TEST TEE	1.00	EA	$ 500.00	$ 500.00		$ 1,000.00
					WATER HAMMER ARRESTOR	9.00	EA	$ 350.00	$ 400.00		$ 750.00
					HOSE BIBB	3.00	EA	$ 1,000.00	$ 400.00		$ 1,400.00
					MIXING VALVE AT FIXTURE	5.00	EA	$ 400.00	$ 400.00		$ 800.00
					THERMOSTATIC MIXING VALVE AT HEATER	1.00	EA	$ 500.00	$ 400.00		$ 900.00

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					SHUT-OFF VALVES	13.00	EA	$ 850.00	$ 800.00		$ 1,650.00
			22 13 16 Sanitary Waste and Vent Piping								$ -
					4" WASTE (UNDER SLAB)	330.00	LF	$ 8,500.00	$ 8,000.00		$ 16,500.00
					3" WASTE (UNDER SLAB)	65.00	LF	$ 4,000.00	$ 4,000.00		$ 8,000.00
					2" WASTE (UNDER SLAB)	10.00	LF	$ 1,000.00	$ 1,500.00		$ 2,500.00
					4" VENT, WASTE	100.00	LF	$ 2,500.00	$ 5,000.00		$ 7,500.00
					3" WASTE	100.00	LF	$ 1,000.00	$ 1,500.00		$ 2,500.00
					2" VENT, WASTE	270.00	LF	$ 4,500.00	$ 13,000.00		$ 17,500.00
					1-1/2" VENT, WASTE	80.00	LF	$ 2,000.00	$ 10,000.00		$ 12,000.00
					2" GALVANIZED PIPE SUMP PUMP DISCHARGE W SUPPORT FITTING	60.00	LF	$ 1,200.00	$ 3,500.00		$ 4,700.00
			22 13 19 Sanitary Waste Piping Specialties								$ -
					3" FLOOR DRAIN	6.00	EA	$ 3,000.00	$ 4,500.00		$ 7,500.00
					4" FLOOR DRAIN	2.00	EA	$ 1,000.00	$ 1,300.00		$ 2,300.00
			22 14 13 Facility Storm Drainage Piping								$ -
					6" STORM, DOWNSPOUT	40.00	LF	$ 3,500.00	$ 3,500.00		$ 7,000.00
					4" STORM, DOWNSPOUT	200.00	LF	$ 8,000.00	$ 10,000.00		$ 18,000.00
					3" STORM, DOWNSPOUT	40.00	LF	$ 1,500.00	$ 3,000.00		$ 4,500.00
					STORM, AREA DRAIN	5.00	EA	$ 500.00	$ 4,000.00		$ 4,500.00
					4" HUB & SPIGOT CI TRANSITION	5.00	EA	$ 150.00	$ 500.00		$ 650.00
					3"FRESH AIR INTAKE	2.00	EA	$ 500.00	$ 500.00		$ 1,000.00
					6" STORM, CI PIPE, (UNDER SLAB)	165.00	LF	$ 17,500.00	$ 8,000.00		$ 25,500.00
					6" COMBINE STORM, CI PIPE, (STREET)	30.00	LF				$ -
					STREET SEWER CONNECTION	1.00	EA				$ -
					6" STORM HOUSE TRAP	2.00	EA	$ 1,000.00	$ 800.00		$ 1,800.00

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					AREA PIT COVER	2.00	EA				$ -
					4" GUTTER DRAIN	2.00	EA				$ -
					3" GUTTER DRAIN	3.00	EA				$ -
			22 14 23 Storm Drainage Piping Specialties								$ -
					CLEANOUT	12.00	EA	$ 1,500.00	$ 2,400.00		$ 3,900.00
			22 14 29 Sump Pumps								$ -
					SUMP PUMP (SP-1) 50 GPM, 1.0 HP	2.00	EA				$ -
			22 33 00 Electric Domestic Water Heaters								$ -
					INSTANTEN. ELECTRIC WATER HEATER (EWH-2)	1.00	EA	$ 500.00	$ 400.00		$ 900.00
			22 40 00 Plumbing Fixtures								$ -
					WATER CLOSET -FLOOR MOUNTED	7.00	EA	$ 7,000.00	$ 4,000.00		$ 11,000.00
					LAVATORY - WALL MOUNTED	7.00	EA	$ 7,000.00	$ 4,000.00		$ 11,000.00
					PANTRY SINK	1.00	EA	$ 1,200.00	$ 1,000.00		$ 2,200.00
					SERVICE SINK	2.00	EA	$ 5,000.00	$ 2,000.00		$ 7,000.00
					DRINKING FOUNTAIN WITH BOBBLER	1.00	EA	$ 2,500.00	$ 1,000.00		$ 3,500.00
		copy above cell and insert copied cell above the row									
					SUB TOTAL			**$ 150,100.00**	**$ 259,400.00**	**$ 8,000.00**	**$ 417,500.00**
		DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)									
			23 05 00 Common Work Results for HVAC		**ALL CUT/CAPS- NO DROPPING OR REMOVAL**			$ 3,000.00	$ 16,000.00		$ 19,000.00
					DEMO CONDENSER INCLUDING WIRINGS AND CONTROLS	1.00	EA				$ -
					DEMO EVAPORATOR INCLUDING WIRINGS AND CONTROLS	1.00	EA				$ -
					DEMO GAS FIRED BOILER INCL.HOOKUP, CONTROLS, AND WIRING	1.00	EA				$ -
					DEMO HWH INCL. HOOKUP, CONTROLS, AND WIRING	1.00	EA				$ -
					DEMO 14 " DIA. BOILER BREECHING	30.00	LF				$ -
					DEMO LOUVER	3.00	EA				$ -
					DEMO AIR OUTLET	31.00	EA				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					DEMO DUCTWORK	5,000.00	LB				$ -
					DEMO PIPE	400.00	LF				$ -
					DEMO CONVECTOR	6.00	EA				$ -
					EXISTING PLENUM TO BE CAPPED	1.00	EA				$ -
					PIPE DISCONNECTIONS AND CAP	12.00	EA				$ -
					REMOVE EXISTING FAN	1.00	EA				$ -
					REF. PIPING IN A 2-HOUR FIRE RATED ENCLOSURE	4.00	EA				$ -
					EQUIPMENT HANDLING & MATERIAL DISTRIBUTION	1.00	EA				$ -
					MISC. (SUB-CONTRACTOR) JOB EXPENSES	1.00	EA				$ -
			23 05 13 Common Motor Requirements for HVAC Equipment								$ -
					INCLUDED IN 23 05 00						$ -
			23 05 29 Hangers and Supports for HVAC Piping and Equipment								$ -
					INABA-DENKO GALV. LINESET W/ SUPPORT BRACKET	250.00	LF	$ 12,000.00			$ 12,000.00
					HORIZONTAL BANDLE PIPE SUPPORT PER DETAIL	5.00	EA				$ -
			23 05 48.13 Vibration Controls for HVAC								$ -
					VIBRATION CONTROL	98.00	SET	$ 19,740.00			$ 19,740.00
			23 05 53 Identification for HVAC Piping and Equipment								$ -
					SYSTEM ID, LABELS AND COLOR CODING	1.00	EA	$ 2,500.00	$ 5,500.00		$ 8,000.00
			23 05 93 Testing, Adjusting, and Balancing for HVAC						$ 20,000.00		$ 20,000.00
					INCLUDED IN GENERAL REQUIREMENTS						$ -
			23 07 00 HVAC Insulation		**ALL INSULATION WORK**			$ -	$ 68,000.00		$ 68,000.00
					DUCT INSULATION (1-1/2" THICK)	3,300.00	SF				$ -
					DUCT LINER (1" ACOUSTICAL LINING)	1,113.00	SF				$ -
					FG REF. PIPE INSULATION (1-1/2" THK)	1,130.00	LF				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					ALUMINUM JACKETING (PIPING OUTSIDE)	300.00	LF				$ -
					FG CONDESATE DRAIN PIPE INSULATION (1" THK)	450.00	LF				$ -
			23 08 00 Commissioning of HVAC								$ -
					INCLUDED IN GENERAL REQUIREMENTS				$ 12,000.00		$ 12,000.00
			23 09 00 Instrumentation and Control for HVAC								$ -
					SOFTWARE, FRONT-END, PROGRAMMING TO BMS	1.00	EA		$ 15,500.00	$ 4,250.00	$ 19,750.00
					JACE 8000 CONTROL PANEL	1.00	EA	$ 1,050.00	$ 15,500.00	$ 7,275.00	$ 23,825.00
					CONTROL POINT COMPONENTS FOR HVAC (INCLUDING WIRING IN CONDUIT AND PANELS)	169.00	PNT	$ 10,625.00	$ 23,250.00		$ 33,875.00
					CONDENSER (ACCU) 3 @ 5 POINTS	15.00	PNT	$ 1,500.00	$ 7,750.00		$ 9,250.00
					EVAPORATOR (AC UNITS) 13 @ 3 POINTS	39.00	PNT	$ 2,500.00	$ 11,625.00		$ 14,125.00
					HEAT RECOVERY 2 @ 3 POINTS	6.00	PNT	$ 1,125.00	$ 3,100.00		$ 4,225.00
					DOAS-1 1 @ 12 POINTS	12.00	PNT	$ 1,000.00	$ 7,750.00		$ 8,750.00
					FAN 2 @ 3 POINTS	6.00	PNT	$ 2,000.00	$ 7,750.00		$ 9,750.00
					MOTORIZED DAMPER @ 1 POINTS	16.00	PNT	$ 750.00	$ 1,550.00		$ 2,300.00
					ELECTRIC FAN HEATERS 7 @ 3 POINTS	21.00	PNT	$ 4,375.00	$ 11,625.00		$ 16,000.00
					ELECTRIC DUCT HEATER 5 @ 2 POINT	10.00	PNT	$ 3,125.00	$ 7,750.00		$ 10,875.00
					CONDENSATE PUMP WITH LEAK SENSOR 14 @ 1 POINT	14.00	PNT	$ 3,500.00	$ 7,750.00		$ 11,250.00
					DUCT MOUNTED SMOKE SENSOR 2 @ 1 POINT	2.00	PNT				$ -
					DIFFERENTIAL PRESSURE SENSOR 1 @ 2 POINTS	2.00	PNT	$ 1,750.00	$ 6,200.00		$ 7,950.00
					STATIC PRESSURE SENSOR 1 @ 2 POINTS	2.00	PNT	$ 1,000.00	$ 3,100.00		$ 4,100.00
					CARBON DIOXIDE SENSOR 7 @ 1 POINT	7.00	PNT	$ 12,100.00	$ 19,475.00		$ 31,575.00
					HUMIDITY SENSOR	2.00	PNT	$ 1,050.00	$ 3,100.00		$ 4,150.00
					DUCT AIR FLOW STATION	1.00	EA		$ 3,100.00		$ 3,100.00
					DIFFERENTIAL PRESSURE SENSOR (DOAS-1)	1.00	EA	$ 800.00	$ 3,100.00		$ 3,900.00

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					REMOTE TEMP. SENSOR 10 @ 1 POINT	13.00	PNT	$ 1,625.00	$ 15,500.00		$ 17,125.00
			23 23 00 Refrigerant Piping		**ALL PIPING WORK**				$ 200,000.00		$ 200,000.00
					REFRIGERANT EVACUATION FROM SYSTEM	100.00	LB				$ -
					1-1/8" REF PIPING INCL. FITTINGS, HANGERS, ACR TYPE 'L' COPPER	110.00	LF				$ -
					7/8" REF PIPING INCL. FITTINGS, HANGERS, ACR TYPE 'L' COPPER	50.00	LF				$ -
					3/4" REF PIPING INCL. FITTINGS, HANGERS, ACR TYPE 'L' COPPER	100.00	LF				$ -
					5/8" REF PIPING INCL. FITTINGS, HANGERS, ACR TYPE 'L' COPPER	250.00	LF				$ -
					1/2" REF PIPING INCL. FITTINGS, HANGERS, ACR TYPE 'L' COPPER	150.00	LF				$ -
					3/8" REF PIPING INCL. FITTINGS, HANGERS, ACR TYPE 'L' COPPER	250.00	LF				$ -
					1/4" REF PIPING INCL. FITTINGS, HANGERS, ACR TYPE 'L' COPPER	220.00	LF				$ -
					1-1/2" CONDENSATE DRAIN PIPE INCL. FITTINGS, HANGERS, TYPE 'L' COPPER	60.00	LF				$ -
					1-1/4" CONDENSATE DRAIN PIPE INCL. FITTINGS, HANGERS, TYPE 'L' COPPER	120.00	LF				$ -
					1" CONDENSATE DRAIN PIPE INCL. FITTINGS, HANGERS, TYPE 'L' COPPER	140.00	LF				$ -
					3/4" CONDENSATE PIPE W/ HANGER,FITTING, INSULATION	140.00	LF				$ -
					CONDENSATE PUMP HOOKUP AT EACH AC AND AHU	13.00	EA				$ -
					REFRIGERANT CHARGE END TEST AS REQUIRED (450 LB)	1.00	EA				$ -
					CONDENSATE PUMP (FOR DOAS-1)	1.00	EA				$ -
					REMOTE CONDENSER CONNECTIONS	3.00	EA				$ -
			23 31 13 Metal Ducts		**ALL SHEET METAL WORK**				$ 265,000.00		$ 265,000.00
					SHEET METAL DUCTWORK	6,850.00	LBS				$ -
					DBL WALL PLENUM AT EXIST LOUVER	1,400.00	LBS				$ -
			23 33 00 Air Duct Accessories								$ -
					ALDES CAR (RADIATION DAMPERS)	7.00	EA				$ -
					CABLE OPERATED DAMPER	44.00	EA				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					FIRE DAMPER W/ ACCESS DOOR (FD/AD)	12.00	EA				$ -
					MOTORIZED DAMPER (MD)	16.00	EA				$ -
					FIRE AND SMOKE DAMPER (FSD)	1.00	EA			$ 1,500.00	$ 1,500.00
					VOLUME CONTROL DAMPER	42.00	EA				$ -
					BACKDRAFT DAMPER AT FAN W/ GUARD	1.00	EA				$ -
					ELEV MACH. RM BACKDRAFT DAMPER AND RAIN CAP	1.00	EA				$ -
					SMOKE HATCH	1.00	EA				$ -
			23 34 16 Centrifugal HVAC Fans		**ALL FANS**			$ -		$ 15,000.00	$ 15,000.00
					TOILET EXHAUST FAN (TX-1, 500 CFM)	1.00	EA				$ -
					SMOKE EXHAUST FAN (SF-1, 500 CFM)	1.00	EA				$ -
			23 37 13 Diffusers, Registers, and Grilles		**ALL AO'S**			$ -		$ 26,000.00	$ 26,000.00
					LINEAR BAR GRILLE (LBG-1)	14.00	EA				$ -
					LINEAR BAR GRILLE (LBG-2) AND WMS	1.00	EA				$ -
					DIFFUSER	42.00	EA				$ -
					48"X6" GRILLE	1.00	EA				$ -
					48"X6" DUCT W/ WMS	1.00	EA				$ -
			23 63 13 Air-Cooled Refrigerant Condensers		**ALL VRF EQUIP. (CU'S, EVAPS, HRU'S)**					$ 110,000.00	$ 110,000.00
					SPLIT SYSTEM CONDENSER, ACCU-1, ACCU-2 (13 TON)	2.00	EA				$ -
					OUTDOOR CONDENSER, CU-1 11 TON	1.00	EA				$ -
			23 74 33 Dedicated Outdoor-Air Units					$ -		$ 125,000.00	$ 125,000.00
					INDOOR EVAPORATOR (AC-1 TO AC-13, UP TO 4 TON)	13.00	EA				$ -
					AHU (DOAS-1) 2000 CFM	1.00	EA				$ -
			23 81 27 Variable Refrigerant Flow HVAC Systems								$ -
					HEAT RECOVERY UNIT (HR-1, HR-2)	2.00	EA				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
			23 82 16.14 Electric-Resistance Air Coils		**ALL ELECTRIC HEATER COST**			$ -		$ 22,000.00	$ 22,000.00
					ELECTRIC FAN HEATER (WH-1, WH-2, WH-3) 3 KW EACH	3.00	EA				$ -
					ELECTRIC FAN HEATER (EH-1 TO EH-4) 1.0 KW EACH	3.00	EA				$ -
			23 82 39.16 Wall and Ceiling Unit Heaters								$ -
					ELECTRIC DUCT HEATER (EDH-1 TO EDH-5) 5 KW EACH	5.00	EA				$ -
		copy above cell and insert copied cell above the row									
					SUB TOTAL			**$ 87,115.00**	**$ 760,975.00**	**$ 311,025.00**	**$ 1,159,115.00**
		DIVISION 26 - ELECTRICAL									
			26 05 00 Common Work Results for Electrical						$ 1,136,000.00		$ 1,136,000.00
					DEMOLITION OF LIGHTING FIXTURE TYPE B-1	36.00	EA				$ -
					DEMOLITION OF LIGHTING FIXTURE TYPE D	36.00	EA				$ -
					DEMOLITION OF LIGHTING FIXTURE TYPE A-1	20.00	EA				$ -
					DEMOLITION OF LIGHTING FIXTURE TYPE WALL MOUNT	27.00	EA				$ -
					DEMOLITION OF LIGHTING FIXTURE TYPE WDOWN LIGHT	10.00	EA				$ -
					MISC DEMOLITION WORKS	1.00	EA				$ -
			26 05 19 Low-Voltage Electrical Power Conductors and Cables								$ -
					# 12 WIRE	19,150.00	LF				$ -
					# 10 WIRE	370.00	LF				$ -
					# 8 WIRE	900.00	LF				$ -
					# 6 WIRE	20.00	LF				$ -
					# 4 WIRE	1,320.00	LF				$ -
					# 3 WIRE	50.00	LF				$ -
					# 2 WIRE	740.00	LF				$ -
					# 1 Wire	240.00	LF				$ -
					# 1/0 Wire	80.00	LF				$ -
					# 500 MCM WIRE	560.00	LF				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
			26 05 26 Grounding and Bonding for Electrical Systems								$ -
					TERMINATION AND BONDING WORKS	51.00	EA				$ -
			26 05 29 Hangers and Supports for Electrical Systems								$ -
					INCLUDED IN 26 05 33.16						$ -
			26 05 33 Raceway and Boxes for Electrical Systems								$ -
					3/4" CONDUIT (EMT)	17,055.00	LF				$ -
					1" CONDUIT (EMT)	150.00	LF				$ -
					1-1/4" CONDUIT (EMT)	810.00	LF				$ -
					1-1/2" CONDUIT (EMT)	60.00	LF				$ -
					2-1/2" CONDUIT (EMT)	30.00	LF				$ -
					4" CONDUIT (EMT)	140.00	LF				$ -
			26 05 53 Identification for Electrical Systems								$ -
					INCLUDED IN 26 05 19; 26 05 33,26 24 16;26 27 26; 26 50 00						$ -
			26 05 73 Power System Studies								$ -
					INCLUDED IN 26 24 16 & 26 27 13						$ -
			26 08 00 Commissioning of Electrical Systems								$ -
					INCLUDED IN GENERAL REQUIREMENTS						$ -
			26 09 23 Lighting Control Devices								$ -
					OCCUPANCY SENSORS	20.00	EA				$ -
			26 24 16 Panelboards								$ -
					SERVICE END BOX	1.00	EA				$ -
					MAIN SERVICE SWITCH W/ CT CABINET/ INCL. YMACON EDISON UTILITY COORDINATION AND FEES	1.00	EA				$ -
					SERVICE SWITCH 30 A, 2P) FOR FA SYSTEM	1.00	EA				$ -
					MAIN DISTRIBUTION PANEL	1.00	EA				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					PANELS (80 A MAINS)	1.00	EA				$ -
					PANELS (100 A MAINS)	3.00	EA				$ -
					PANELS (100 A MB)	1.00	EA				$ -
					PANELS (125 A MAINS)-MP	1.00	EA				$ -
					AC UNITS/EQUIPMENT CONNECTIONS W/ DISCONNECT SWITCH	23.00	EA				$ -
					ACC UNIT W/DISCONNECT SWITCH , WP	3.00	EA				$ -
					PLUMBING EQUIPMENT W/DISCONNECT SWITCH	4.00	EA				$ -
					EQUIPMENT CONNECTIONS W/ DISCONNEC SWITCH AC-1,2	2.00	EA				$ -
					EQUIPMENT CONNECTIONS W/ DISCONNEC SWITCH CU-1	1.00	EA				$ -
					EQUIPMENT CONNECTIONS W/ DISCONNEC SWITCH DOAS-1	1.00	EA				$ -
					EQUIPMENT CONNECTIONS W/ DISCONNEC SWITCH PE-1	1.00	EA				$ -
					EQUIPMENT CONNECTIONS W/ MOMENTARY CONTACT SW.	5.00	EA				$ -
					ELEVATOR (30 HP) W/ DISCONNECT SWITCH	1.00	EA				$ -
			26 27 13 Electricity Metering								$ -
					SERVICE END BOX	1.00	EA				$ -
					MAIN SERVICE SWITCH W/ CT CABINET/ INCL. YMACON EDISON UTILITY COORDINATION AND FEES	1.00	EA				$ -
			26 27 26 Wiring Devices								$ -
					SWITCHES	17.00	EA				$ -
					SWITCHES - DIMMERS/VACANCY SENSORS	5.00	EA				$ -
					LIGHTING CONTROLS - CEILING MTD.	6.00	EA				$ -
					LIGHTING CONTROLS W/ BACKBOARD	1.00	EA				$ -
					RECEPTACLES - DUPLEX	63.00	EA				$ -
					RECEPTACLES - DUPLEX W/ SWITCH	5.00	EA				$ -
					RECEPTACLES - DUPLEX (FURNITURE MTD.)	10.00	EA				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					RECEPTACLES - DUPLEX,WP	2.00	EA				$ -
					RECEPTACLES - DUPLEX (GFCI)WP	1.00	EA				$ -
					RECEPTACLES - QUAD	12.00	EA				$ -
					RECEPTACLES - QUAD (GFCI }	2.00	EA				$ -
					LIGHTING OUTLETS	10.00	EA				$ -
			26 28 13 Fuses								$ -
					VARIOUS SIZE OF FUSES	18.00	EA				$ -
			26 28 16.13 Enclosed Circuit Breakers								$ -
					INCLUDED IN 26 24 16						$ -
			26 28 16.16 Enclosed Switches								$ -
					AC UNITS/EQUIPMENT CONNECTIONS W/ DISCONNECT SWITCH	23.00	EA				$ -
					ACC UNIT W/DISCONNECT SWITCH , WP	3.00	EA				$ -
					PLUMBING EQUIPMENT W/DISCONNECT SWITCH	4.00	EA				$ -
					EQUIPMENT CONNECTIONS W/ DISCONNEC SWITCH AC-1,2	2.00	EA				$ -
					EQUIPMENT CONNECTIONS W/ DISCONNEC SWITCH CU-1	1.00	EA				$ -
					EQUIPMENT CONNECTIONS W/ DISCONNEC SWITCH DOAS-1	1.00	EA				$ -
					EQUIPMENT CONNECTIONS W/ DISCONNEC SWITCH PE-1	1.00	EA				$ -
					EQUIPMENT CONNECTIONS W/ MOMENTARY CONTACT SW.	5.00	EA				$ -
					ELEVATOR (30 HP) W/ DISCONNECT SWITCH	1.00	EA				$ -
			26 29 13 Enclosed Controllers								$ -
					TX-1	1.00	EA				$ -
					SF-1	1.00	EA				$ -
			26 33 23 Central Battery Equipment								$ -
					CENTRAL BATTERY SYSTEM Ms V.2	1.00	EA				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
			26 43 13 Surge Protective Devices for Low-Voltage Electrical Power Circuits								$ -
					SURGE PROTECTOR B93-00-4741	1.00	EA				$ -
			26 50 00 Lighting								$ -
					LIGHTING FIXTURE (TYPE AL1) LED DOWNLIGHT	8.00	EA				$ -
					LIGHTING FIXTURE (TYPE BD1) VANITY SCONCE	5.00	EA				$ -
					LIGHTING FIXTURE (TYPE BS1, WALL MTD. STAIRLIGHTS	57.00	LF				$ -
					LIGHTING FIXTURE (TYPE CD1) 5" LED LUMINAIRE	5.00	EA				$ -
					LIGHTING FIXTURE (TYPE CD2) 12" LED LUMINAIRE	25.00	EA				$ -
					LIGHTING FIXTURE (TYPE CD3) 7" LED LUMINAIRE	52.00	EA				$ -
					LIGHTING FIXTURE (TYPE DL1) ADJUSTABLE DOWNLIGHT	10.00	EA				$ -
					LIGHTING FIXTURE (TYPE DL2) ADJUSTABLE DOWNLIGHT	12.00	EA				$ -
					LIGHTING FIXTURE (TYPE DL3) DOWNLIGHT WIDE BEAM	4.00	EA				$ -
					LIGHTING FIXTURE (TYPE DL4) RECESSED DOWNLIGHT	6.00	EA				$ -
					LIGHTING FIXTURE (TYPE EX1/EX2 }	12.00	EA				$ -
					LIGHTING FIXTURE (TYPE PB1/PB2)	57.00	EA				$ -
					LIGHTING FIXTURE (TYPE RUI)	176.00	LF				$ -
					LIGHTING FIXTURE (TYPE RWI)RECESSED WALLWASHER	1.00	EA				$ -
					LIGHTING FIXTURE (TYPE SG1/SG4)	2.00	EA				$ -
					LIGHTING FIXTURE (TYPE SG1)	15.00	EA				$ -
					LIGHTING FIXTURE (TYPE SG4)	4.00	EA				$ -
					LIGHTING FIXTURE (TYPE SRI)RECESSED VERTICAL STRIPLIGHT	54.00	LF				$ -
					LIGHTING FIXTURE (TYPE SU4) COVELIGHTS	240.00	LF				$ -
					LIGHTING FIXTURE (TYPE XBD-1)EXTERIOR WALL SCONCE	5.00	EA				$ -
					LIGHTING FIXTURE (TYPE XB-2) EXTERIOR WALL FLOODLIGHT SCONCE	7.00	EA				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					LIGHTING FIXTURE (TYPE XKD-1) EXTERIOR IN-WALL LIGHT	10.00	EA				$ -
					TYPE PL-1 (UTILITY LIGHT)ALLOWANCE	9.00	EA				$ -
					LIGHTING FIXTUES (RECESSED WALL MOUNTED)	10.00	EA				$ -
		copy above cell and insert copied cell above the row									
					SUB TOTAL				**$ 1,136,000.00**		**$ 1,136,000.00**
		DIVISION 27 - COMMUNICATIONS									
			27 10 00 Structured Cabling					$ 10,000.00	$ 20,000.00		$ 30,000.00
					IT RACK	1.00	EA				$ -
					WIRELESS ACCES POINT	6.00	EA				$ -
					IP PHONES (FBO)	10.00	EA				$ -
					TIME CLOCK (FBO)	2.00	EA				$ -
					DATA/TELEPHONE OUTLET	27.00	EA				$ -
					DATA/TELEPHONE OUTLET (WALL MOUNT)	8.00	EA				$ -
					3/4" CONDUIT (EMT)	2,000.00	LF				$ -
					CAT 6E OR SIMILAR	2,000.00	LF				$ -
			27 41 00 Audio-Video Systems					$ 15,000.00	$ 28,000.00		$ 43,000.00
					DATA OUTLETS/AV JUNCTION BOXES	29.00	EA				$ -
					POWER/DATA FLOOR BOXES	11.00	EA				$ -
					3/4" CONDUIT (EMT)	7,500.00	LF				$ -
					CAT 6E OR SIMILAR	7,600.00	LF				$ -
		copy above cell and insert copied cell above the row									
					SUB TOTAL			**$ 25,000.00**	**$ 48,000.00**		**$ 73,000.00**
		DIVISION 28 - ELECTRONIC SAFETY AND SECURITY									
			28 00 00 Electronic Safety and Security					$ 50,000.00	$ 80,000.00		$ 130,000.00
					SECURITY ALARM PANEL	1.00	EA				$ -
					MAGNETIC DOOR CONTACTS	13.00	EA				$ -
					ELECTRIC DOOR STRIKE	6.00	EA				$ -
					HOLD UP ALARM CONTACT	3.00	EA				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					CARD READERS	11.00	EA				$ -
					MOTION SENSORS	6.00	EA				$ -
					PANIC BUTTON	3.00	EA				$ -
					SIELOX 1700 BOARDS	1.00	EA				$ -
					MONITOR DISPLAY	3.00	EA				$ -
					3/4" CONDUIT (RGS)	1,800.00	LF				$ -
					CAT 6E OR SIMILAR	1,800.00	LF				$ -
			28 08 00 Commissioning of Electronic Safety and Security								$ -
					INCLUDED IN GENERAL REQUIREMENTS						$ -
			28 46 20 Fire Alarm					$ 25,000.00	$ 50,000.00		$ 75,000.00
					NEW FIRE ALARM PANEL W/ AUTODIALER	1.00	EA				$ -
					TESTING , VENDOR FEES, FILING FEES, PROGRAMMING	1.00	EA				$ -
					FA REMOTE ANNUNCIATOR	2.00	EA				$ -
					PULLSTATIONS	5.00	EA				$ -
					DOOR RELEASE	7.00	EA				$ -
					SPEAKER CEILING/WALL	15.00	EA				$ -
					STROBES	6.00	EA				$ -
					COMBINATION HORN/STROBES	18.00	EA				$ -
					SMOKE DETECTORS	51.00	EA				$ -
					SMOKE DETECTORS ADDRESABLE	1.00	EA				$ -
					SMOKE DETECTORS (DUCT MTD.)	2.00	EA				$ -
					CONTROL RELAYS	6.00	EA				$ -
					FIRE SMOKE DAMPER	1.00	EA				$ -
					3/4" CONDUIT (RGS) FOR FIRE ALARM	3,200.00	LF				$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					4/C # 14 WIRE	3,200.00	LF				$ -
		copy above cell and insert copied cell above the row									
					SUB TOTAL			**$ 75,000.00**	**$ 130,000.00**		**$ 205,000.00**
		DIVISION 31 - EARTHWORK									
			31 20 00 Earth Moving					$ 40,000.00	$ 140,000.00	$ 35,000.00	$ 215,000.00
					EXCAVATING & BACKFILL AT BASEMENT FOUNDATION UNDERPINNING ALONG AXES F (HAND EXCAVATION)	11.32	CY				$ -
					EXCAVATING FOR BASEMENT FOUNDATION UNDERPINNING ALONG AXES F (EXTERIOR, HAND EXCAVATION))	69.50	CY				$ -
					EXCAVATING FOR ADDITION	215.00	CY				$ -
					BACKFILL FOR ADDITION	39.67	CY				$ -
					EXCAVATING FOR HARDSCAPE	60.00	CY				$ -
					BACKFILL FOR HARDSCAPE	30.00	CY				$ -
					EXCAVATING FOR NEW ST AND SAN PIPING FOR UTILITY WORKS	54.07	CY				$ -
					BACKFILL FOR FOR UTILITY WORKS	54.07	CY				$ -
			31 50 00 Excavation Support and Protection					$ 140,000.00	$ 170,000.00	$ 36,466.00	$ 346,466.00
					SUPPORT OF EXCAVATION - DRILLED SOLDIER PILES 30' DEEP	480.00	LF				$ -
					TIMBER LAGGING	637.50	SF				$ -
		copy above cell and insert copied cell above the row									
					SUB TOTAL			**$ 180,000.00**	**$ 310,000.00**	**$ 71,466.00**	**$ 561,466.00**
		DIVISION 32 - EXTERIOR IMPROVEMENTS									
			32 01 90.33 Tree and Shrub Preservation					$ 5,000.00	$ 6,000.00		$ 11,000.00
					INCL. W/ GENERAL REQUIREMENTS						$ -
			32 05 13 Soils for Exterior Improvements								$ -
					EXCAVATE AND HAUL EXISTING SOIL	104.00	CY	$ 5,000.00	$ 10,000.00		$ 15,000.00
					NEW PLANTING SOIL, INCL. FINAL GRADING	57.00	CY	$ 3,000.00	$ 6,000.00		$ 9,000.00
					NEW CLEAN FILL, INCL. COMPACTION	57.00	CY	$ 3,000.00	$ 6,000.00		$ 9,000.00
			32 13 13 Concrete Paving								$ -
					6" THICK CONCRETE COLORED SIDEWALK, 6'THICK GRAVEL OVER COMPACTED SOIL; BROOM BRUSHED FINISH	380.00	SF	$ 10,000.00	$ 20,000.00		$ 30,000.00
			32 31 13 Chain Link Fences and Gates								$ -

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:
					36" SWING GATE AT ABOVE	1.00	EA	$ 3,000.00	$ 2,000.00		$ 5,000.00
					NEW CHAIN LINK HVAC EQUIPMENT ENCLOSURE	240.00	SF	$ 10,000.00	$ 15,000.00		$ 25,000.00
			32 31 19 Decorative Metal Fences and Gates								$ -
					NEW BLACK STEEL FENCE (6'H, OVER EXISTING CURB AND RETAINING WALL)	78.00	LF	$ 15,000.00	$ 10,000.00		$ 25,000.00
			32 93 00 Plants					$ 30,000.00	$ 40,000.00		$ 70,000.00
					NEW TREE: EASTERN REDBUD, 3" CALIPER, B&B (INCL. TREE PIT WORK AND ROOTBALL STABILIZATION)	2.00	EA				$ -
					NEW SHRUB: MIDWINTER FIREWOOD DOGWOOD, #5	6.00	EA				$ -
					NEW GROUNDCOVER: JAPANESE GARDEN JUNIPER, #3	170.00	EA				$ -
					NEW GROUNDCOVER: BEARBERRY, #1	51.00	EA				$ -
					NEW GROUNDCOVER: CREEPING LILY TURF, #1	376.00	EA				$ -
					NEW GROUNDCOVER: FOAM FLOWER, #1	165.00	EA				$ -
					NEW GROUNDCOVER: ANGELINA STONECROP, #1	88.00	EA				$ -
					NEW GROUNDCOVER: WOOLLY THYME, #1	127.00	EA				$ -
					NEW BULBS: CROCUS SPP	217.00	EA				$ -
					NEW BULBS: DWARF IRIS PIXIE	137.00	EA				$ -
					NEW BULBS: VIOLET WOODSORREL, 4" CONT.	111.00	EA				$ -
					NEW VINE: TRUMPET HONEYSUCKLE, #1	7.00	EA				$ -
					SHREDDED BARK MULCH	0.20	CY				$ -
					GRAVEL MULCH	9.30	CY				$ -
			32 96 00 Transplanting								$ -
					TRANSPLANT EXISTING TREE TO NEW LOCATION	1.00	EA	$ 1,200.00	$ 1,500.00		$ 2,700.00
		copy above cell and insert copied cell above the row									
					SUB TOTAL			**$ 85,200.00**	**$ 116,500.00**		**$ 201,700.00**
					Hard Cost:			**$ 2,743,030.00**	**$ 6,732,223.00**	**$ 430,491.00**	**$ 9,905,744.00**
					Hard Cost Summary(Including General Requirement):						**$ 11,880,744.00**

Department of Design and Construction

CONTRACTOR'S DETAILED BID BREAKDOWN FORM

Project ID: LQASADA

Project Name: Astoria Branch Library Renovation (Medium GC PQL)

Name of the Bidder: Jobco Incorporated

Hard Cost Estimate (Level 2)

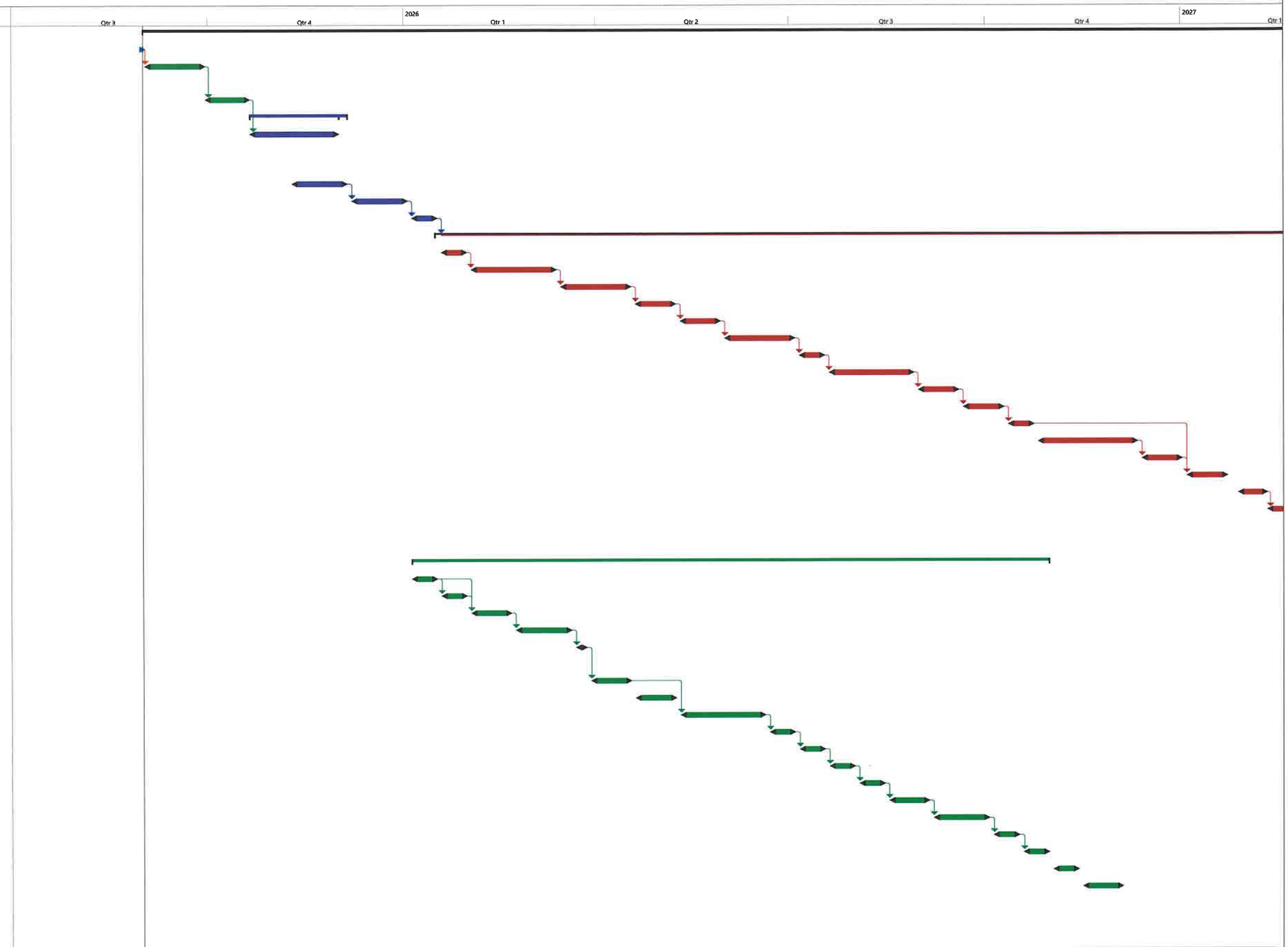
No.	Sub Work (*)	CSI Division:	CSI Sub Division:	RSMeans 12-digit item code:	Description:	Qty	Unit:	Total Cost of Material $:	Total Cost of Labor $:	Total Cost of Equipment $:	Grand total of Material,Labor & Eqp.$:

Note:

1. Bidders' total material,labor, and equipment costs are fully-loaded with markups
2. Quanity includes expected material wastage
3. (*) Identify possible Sub Contract Work items
4. Shaded cell is where data must be entered

JOBCO INCORPORATED

ID	Task Mode	Task Name	Duration	Start	Finish
1		**Baisley Park Library**	**532 days**	**Mon 9/1/25**	**Tue 9/14/27**
2		Notice to Proceed	1 day	Mon 9/1/25	Mon 9/1/25
3		DDC Submittal/ approval credentials/RFAS	4 wks	Tue 9/2/25	Mon 9/29/25
4		AMC Permits	3 wks	Tue 9/30/25	Mon 10/20/25
5		**Asbestos removal**	**34 days**	**Tue 10/21/25**	**Fri 12/5/25**
6		Mobilization/ Temp walls/ Protection/AMC removal/sign off	6 wks	Tue 10/21/25	Mon 12/1/25
7		Close out Documents	4 wks	Mon 11/10/25	Fri 12/5/25
8		Approved Drawings	4 wks	Mon 12/8/25	Fri 1/2/26
9		Permits	2 wks	Mon 1/5/26	Fri 1/16/26
10		**Interior**	**334 days**	**Fri 1/16/26**	**Wed 4/28/27**
11		Mobilization	2 wks	Mon 1/19/26	Fri 1/30/26
12		Interior Demo	6 wks	Mon 2/2/26	Fri 3/13/26
13		Interior Steel Beams/Decking	5 wks	Mon 3/16/26	Fri 4/17/26
14		Interior Concrete	3 wks	Mon 4/20/26	Fri 5/8/26
15		Interior Framing	3 wks	Mon 5/11/26	Fri 5/29/26
16		MEP's Roughing	5 wks	Mon 6/1/26	Fri 7/3/26
17		MEP's Inspections	2 wks	Mon 7/6/26	Fri 7/17/26
18		Insulation/Sheetrock/ Taping	6 wks	Mon 7/20/26	Fri 8/28/26
19		Tile/Flooring	3 wks	Mon 8/31/26	Fri 9/18/26
20		Finish Doors/Trim	3 wks	Mon 9/21/26	Fri 10/9/26
21		Prime Paint	2 wks	Mon 10/12/26	Fri 10/23/26
22		Book shelfs/furniture	7 wks	Mon 10/26/26	Fri 12/11/26
23		Finish Paint	3 wks	Mon 12/14/26	Fri 1/1/27
24		MEP's Finishes	3 wks	Mon 1/4/27	Fri 1/22/27
25		Finishes	2 wks	Thu 1/28/27	Wed 2/10/27
26		Punchlist	2 wks	Thu 2/11/27	Wed 2/24/27
27		Final Inspections	7 wks	Thu 2/25/27	Wed 4/14/27
28		Demobilization	2 wks	Thu 4/15/27	Wed 4/28/27
29		**Exterior**	**240 days**	**Mon 1/5/26**	**Fri 12/4/26**
30		Mobilization	2 wks	Mon 1/5/26	Fri 1/16/26
31		Erosion/Tree Protection control	2 wks	Mon 1/19/26	Fri 1/30/26
32		Demo/Excavation/Removal	3 wks	Mon 2/2/26	Fri 2/20/26
33		Concrete footing/foundations	4 wks	Mon 2/23/26	Fri 3/20/26
34		Waterproofing/controlled backfill	1 wk	Mon 3/23/26	Fri 3/27/26
35		CMU/Brick/Replacement Brick	3 wks	Mon 3/30/26	Fri 4/17/26
36		Steel Post/Lintels	3 wks	Mon 4/20/26	Fri 5/8/26
37		Windows/Glazing	6 wks	Mon 5/11/26	Fri 6/19/26
38		Roofing/Coping/Paint	2 wks	Mon 6/22/26	Fri 7/3/26
39		Drainage	2 wks	Mon 7/6/26	Fri 7/17/26
40		Undergrounds	2 wks	Mon 7/20/26	Fri 7/31/26
41		Concrete/Curbs/Bollards	2 wks	Mon 8/3/26	Fri 8/14/26
42		Site work/Grading	3 wks	Mon 8/17/26	Fri 9/4/26
43		Pavers/sidewalks/Flagpole	4 wks	Mon 9/7/26	Fri 10/2/26
44		Landscaping/Green Roofs	2 wks	Mon 10/5/26	Fri 10/16/26
45		Exterior signs and finishes	2 wks	Mon 10/19/26	Fri 10/30/26
46		Punchlist	2 wks	Mon 11/2/26	Fri 11/13/26
47		Final Inspection	3 wks	Mon 11/16/26	Fri 12/4/26
48		**CLOSE OUT DOCUMENTS**	**100 days**	**Wed 4/28/27**	**Tue 9/14/27**
49		Final close out documents	16 wks	Wed 4/28/27	Tue 8/17/27
50		CO	4 wks	Wed 8/18/27	Tue 9/14/27



Project: Baisley Park Library Reno.
Date: 9/1/2025

Task | Split | Milestone | Summary | Project Summary | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | External Tasks | External Milestone | Deadline | Progress | Manual Progress

**** Dates Are Subject To Change Due To Unforeseen Conditions ****

Construction Employment Rider

The City of New York Department of Small Business Services
Division of Labor Services Contract Compliance Unit
110 William Street, New York, New York 10038
Phone: (212) 513 – 6323
Fax: (212) 618-8879

CONSTRUCTION EMPLOYMENT REPORT

GENERAL INFORMATION

1. Your contractual relationship in this contract is: Prime contractor X Subcontractor ____

1a. Are M/WBE goals attached to this project? Yes X No ____

2. Please check one of the following if your firm would like information on how to certify with the City of New York as a:

___Minority Owned Business Enterprise
___Women Owned Business Enterprise
___Disadvantaged Business Enterprise
___Locally Based Business Enterprise
___Emerging Business Enterprise

2a. If you are certified as an **MBE**, **WBE**, **LBE, EBE** or **DBE**, what city/state agency are you certified with? _____ Are you DBE certified? Yes ____ No X

3. Please indicate if you would like assistance from SBS in identifying certified M/WBEs for contracting opportunities: Yes___ No X

4. Is this project subject to a project labor agreement? Yes X No ____

5. Are you a Union contractor? Yes ____ No X If yes, please list which local(s) you affiliated with _____

6. Are you a Veteran owned company? Yes ____ No X

PART I: CONTRACTOR/SUBCONTRACTOR INFORMATION

7. 11-1734293 — Striantafyllou@jobco.com
Employer Identification Number or Federal Tax I.D. — Email Address

8. Jobco Incorporated
Company Name

9. 3333 New Hyde Park Rd. Suite 200. New Hyde Park, NY 11042
Company Address and Zip Code

10. Robert M. Pascucci — 516-487-0050
Chief Operating Officer — Telephone Number

11. Same
Designated Equal Opportunity Compliance Officer — Telephone Number
(If same as Item #10, write "same")

12. Same
Name of Prime Contractor and Contact Person
(If same as Item #8, write "same")

13. Number of employees in your company: 30

14. Contract information:

(a) Department of Design and Construction
Contracting Agency (City Agency)

(b) $11,544,330.00
Contract Amount

(c) #85025B0032
Procurement Identification Number (PIN)

(d) LQBPEXPN
Contract Registration Number (CT#)

(e) _____
Projected Commencement Date

(f) _____
Projected Completion Date

(g) Description and location of proposed contract:

Baisley Park Libary Renovation

117-11 Sutphin Blvd. Jamaica, NY 11434

15. Has your firm been reviewed by the Division of Labor Services (DLS) within the past 36 months and issued a Certificate of Approval? Yes___ No X

If yes, attach a copy of certificate.

16. Has DLS within the past month reviewed an Employment Report submission for your company and issued a Conditional Certificate of Approval? Yes___ No X

If yes, attach a copy of certificate.

NOTE: DLS WILL NOT ISSUE A CONTINUED CERTIFICATE OF APPROVAL IN CONNECTION WITH THIS CONTRACT UNLESS THE REQUIRED CORRECTIVE ACTIONS IN PRIOR CONDITIONAL CERTIFICATES OF APPROVAL HAVE BEEN TAKEN.

17. Has an Employment Report already been submitted for a different contract (not covered by this Employment Report) for which you have not yet received compliance certificate?
Yes___ No X If yes,

Date submitted: N/A
Agency to which submitted: _____
Name of Agency Person: _____
Contract No: _____
Telephone: _____

18. Has your company in the past 36 months been audited by the United States Department of Labor, Office of Federal Contract Compliance Programs (OFCCP)? Yes___ No X

If yes,

(a) Name and address of OFCCP office.

_____

_____

(b) Was a Certificate of Equal Employment Compliance issued within the past 36 months? Yes___ No___

If yes, attach a copy of such certificate.

(c) Were any corrective actions required or agreed to? Yes___ No___

If yes, attach a copy of such requirements or agreements.

(d) Were any deficiencies found? Yes___ No___

If yes, attach a copy of such findings.

19. Is your company or its affiliates a member or members of an employers' trade association which is responsible for negotiating collective bargaining agreements (CBA) which affect construction site hiring? Yes___ No X

If yes, attach a list of such associations and all applicable CBA's.

PART II: DOCUMENTS REQUIRED

20. For the following policies or practices, attach the relevant documents (e.g., printed booklets, brochures, manuals, memoranda, etc.). If the policy(ies) are unwritten, attach a full explanation of the practices. See instructions.

Yes (a) Health benefit coverage/description(s) for all management, nonunion and union employees (whether company or union administered)

Yes (b) Disability, life, other insurance coverage/description

Yes (c) Employee Policy/Handbook

Yes (d) Personnel Policy/Manual

No (e) Supervisor's Policy/Manual

Yes (f) Pension plan or 401k coverage/description for all management, nonunion and union employees, whether company or union administered

No (g) Collective bargaining agreement(s).

Yes (h) Employment Application(s)

No (i) Employee evaluation policy/form(s).

Yes (j) Does your firm have medical and/or non-medical (i.e. education, military, personal, pregnancy, child care) leave policy?

Yes (k) Sexual Harassment Policy

21. To comply with the Immigration Reform and Control Act of 1986 when and of whom does your firm require the completion of an I-9 Form?

(a) Prior to job offer	Yes___	No X
(b) After a conditional job offer	Yes___	No X
(c) After a job offer	Yes___	No X
(d) Within the first three days on the job	Yes___	No X
(e) To some applicants	Yes___	No X
(f) To all applicants	Yes___	No X
(g) To some employees	Yes___	No X
(h) To all employees	Yes___	No X

22. Explain where and how completed I-9 Forms, with their supportive documentation, are maintained and made accessible.
N/A

23. Does your firm or any of its collective bargaining agreements require job applicants to take a medical examination? Yes___ No X

If yes, is the medical examination given:

(a) Prior to a job offer	Yes___	No___
(b) After a conditional job offer	Yes___	No___
(c) After a job offer	Yes___	No___
(d) To all applicants	Yes___	No___
(e) Only to some applicants	Yes___	No___

If yes, list for which applicants below and attach copies of all medical examination or questionnaire forms and instructions utilized for these examinations.

24. Do you have a written equal employment opportunity (EEO) policy? Yes X No___

If yes, list the document(s) and page number(s) where these written policies are located.

25. Does the company have a current affirmative action plan(s) (AAP)
No Minorities and Women
No Individuals with handicaps
No Other. Please specify _____

26. Does your firm or collective bargaining agreement(s) have an internal grievance procedure with respect to EEO complaints? Yes___ No X

If yes, please attach a copy of this policy.

If no, attach a report detailing your firm's unwritten procedure for handling EEO complaints.

27. Has any employee, within the past three years, filed a complaint pursuant to an internal grievance procedure or with any official of your firm with respect to equal employment opportunity? Yes___ No X

If yes, attach an internal complaint log. See instructions.

28. Has your firm, within the past three years, been named as a defendant (or respondent) in any administrative or judicial action where the complainant (plaintiff) alleged violation of any anti-discrimination or affirmative action laws? Yes___ No X

If yes, attach a log. See instructions.

29. Are there any jobs for which there are physical qualifications? Yes___ No X

If yes, list the job(s), submit a job description and state the reason(s) for the qualification(s).

_____

_____

30. Are there any jobs for which there are age, race, color, national origin, sex, creed, disability, marital status, sexual orientation, or citizenship qualifications? Yes___ No X

If yes, list the job(s), submit a job description and state the reason(s) for the qualification(s).

_____

_____

SIGNATURE PAGE

I, (print name of authorized official signing) Spiros Triantafyllou hereby certify that the information submitted herewith is true and complete to the best of my knowledge and belief and submitted with the understanding that compliance with New York City's equal employment requirements, as contained in Chapter 56 of the City Charter, Executive Order No. 50 (1980), as amended, and the implementing Rules and Regulations, is a contractual obligation. I also agree on behalf of the company to submit a certified copy of payroll records to the Division of Labor Services on a monthly basis.

Jobco Incorporated
Contractor's Name

Spiros Triantafyllou — Secretary
Name of person who prepared this Employment Report — Title

Spiros Triantafyllou — Secretary
Name of official authorized to sign on behalf of the contractor — Title

516-487-0050
Telephone Number

Signature of authorized official — 3/10/25
Date

If contractors are found to be underutilizing minorities and females in any given trade based on Chapter 56 Section 3H, the Division of Labor Services reserves the right to request the contractor's workforce data and to implement an employment program.

Contractors who fail to comply with the above mentioned requirements or are found to be in noncompliance may be subject to the withholding of final payment.

Willful or fraudulent falsifications of any data or information submitted herewith may result in the termination of the contract between the City and the bidder or contractor and in disapproval of future contracts for a period of up to five years. Further, such falsification may result in civil and/and or criminal prosecution.

To the extent permitted by law and consistent with the proper discharge of DLS' responsibilities under Charter Chapter 56 of the City Charter and Executive Order No. 50 (1980) and the implementing Rules and Regulations, all information provided by a contractor to DLS shall be confidential.

Only original signatures accepted.

Sworn to before me this 10th day of MARCH 20 25

Notary Public — Authorized Signature — 03·10·2025
Date

Barbara Jeanne McDermott
Notary Public, State of New Yok
Registration No. 01MC4979750
Qualified in Suffolk County
My Commission Expires November 6, 2027

FOR OFFICIAL USE ONLY: File No._____

JOBCO INCORPORATED
EQUAL EMPLOYMENT OPPORTUNITY

Jobco Incorporated and its affiliated companies (hereinafter referred to as "Jobco") observes a policy to provide equal employment opportunity to all applicants and to provide equal employment opportunity and individual growth opportunities to all employees in accordance with all applicable federal and state laws and executive orders, as well as all implementing regulations.

Jobco hires, transfers, promotes, compensates, terminates and makes all other employment decisions concerning applicants and employees without regard to their race, color, creed, religion, national origin, age, sex, marital status, political affiliation, citizenship, lawful alien status, non-job related physical or mental disability, veteran status, sexual orientation, or other basis prohibited by law. Employment actions are based upon operating needs and individual applicant or employee merit, including, but not limited to, qualifications, experience, ability, availability, cooperation and job performance.

Further, Jobco is an affirmative action contractor and sub-contractor, and it is our policy to comply with Executive Order 11246, as amended, the Rehabilitation Act of 1973, the Vietnam Era Veterans Readjustment Assistance Act of 1974 (VEVRA), and all state and local affirmative action requirements and all implementing regulations. In an effort to promote affirmative action, Jobco has implemented a formal written Affirmative Action program companywide.

Jobco is in compliance with the Americans with Disabilities Act of 1990 and promotes the hiring, promotion and retention of persons with disabilities. Jobco will reasonably accommodate such employees except when such accommodation would interfere with a bona fide occupational qualification. Employees with disabilities are encouraged to contact management regarding their disability status and any reasonable accommodation necessary.

NYC buildings
CONSTRUCTION SUPERINTENDENT
Name: Stephen Hatzigeorgiou
Registration No: 30446
Issue Date: 08/01/2023
Exp. Date: 08/01/2026
Commissioner's Signature

Jobco Incorporated

3333 New Hyde Park Rd. Suite 200
New Hyde Park, NY 11042

Telephone: (516) 487-0050
Facsimile: (516) 487-0014

March 17, 2025

Re: ID# LQBPEXPN
PIN #: 85025B0032
Baisley Park Library Renovation

Project Specific Information

1. Jobco Incorporated has gained vast experience in construction since 1954. Jobco provides a complete range of construction services for government projects, public and private developers, and property managers. We have worked on the following:

    a. Public Work Projects
    b. Schools
    c. Historic/Landmark Rehabilitation
    d. Multi-Family and Senior-Citizen Housing
    e. Condominiums
    f. Commercial Complexes
    g. Office Buildings

2. Resumes of Key Personnel to be involved in project (please see attached)

    a. Robert M. Pascucci – President
    b. Spiros Triantafyllou – Project Manager
    c. Peter Apsilos – Project Manager
    d. Stephan Hatzigeorgiou – Site Super
    e. July Gonzalez – Assistant Project Manager

3. Significant pieces of equipment expected to be used for contract
    a. Power tools – owned
    b. Man lifts - leased
    c. Boom lifts - leased

4. Description of work expected to be subcontracted, and to what firm:

    a. Plumbing : Maccarone Plumbing
    b. Electrical : Palace Electrical
    c. HVAC : CCIA
    d. Asbestos : ASAR Environmental
    e. Millwork : AGATI

5. Key Material Suppliers
    a. FBM
    b. AGATI Millwork

6. Preliminary bar chart time schedule (see attached)

7. We are capable of financing at least 2 months billing or as needed with our own corporate equity and line of credit.

8. We do not see any issues impacting our ability to complete the project according to the contract.

We look forward to working with you on this project. Please let us know with any questions.

Thank you.

Spiros Triantafyllou

Robert M. Pascucci, P.E.
President

Professional Engineer; Attorney At Law; Licensed Real Estate Broker; Worcester Polytechnic Institute, B.S.C.E.; St. John's University, School of Law, J.D.; New York University Graduate School of Business, Graduate Business courses.

Mr. Pascucci is a licensed Professional Engineer and an Attorney At Law registered in the State of New York. His professional affiliations include the American Bar Association, the National Society of Professional Engineers, the American Society of Civil Engineers, the Chief Executives' Organization, and the World Presidents' Organization. Mr. Pascucci is a member of the World Presidents' Organization Metro (NY) Chapter Board of Directors, the Nassau County AHRC Foundation Board of Directors, and the Glen Cove Boys & Girls Club Board of Managers. He is a past member of the Green Vale School Board of Trustees, the Madison Square Boys & Girls Club Bronx Board of Managers, Glen Cove Chamber of Commerce, the Association for a Better Long Island, the Young Presidents' Organization, and the Glen Cove Downtown Business Improvement District (BID) Board.

Mr. Pascucci was honored by the Nassau County Chapter of AHRC as its 2006 Leadership Award Recipient. He received the Developer of the Year Award in 2006 by the Carroll Gardens Association, Inc. He received the Community Service Award from the Bronx Boys & Girls Club in 2001. He was also honored by Networking Magazine in 2009 as a recipient of its David Award.

With Jobco since 1980, Mr. Pascucci oversees all development, construction and property management operations. He was previously a project engineer for HRH Construction Corporation and later for the Glen Cove Community Development Agency. Prior to joining Jobco, Mr. Pascucci was associated with the law firm of Max E. Greenberg, Cantor & Reiss.

Peter Apsilos

peterapsilos@gmail.com (917) 440-9865 m / (516) 921-0558 h

Profile

- Results-oriented construction and development manager with a 28-year record of success in overseeing all phases of multimillion dollar construction and infrastructure for government, private sector, multifamily residential and commercial projects. Lead and coordinate project management for a high volume of construction projects from inception to completion, including project planning, cost estimation, budget preparation, bidding, procurement, scheduling, permitting, inspections, quality control, risk management and project closeout.

Experience

2023-Present Jobco Incorporated New Hyde Park, NY

Senior Project manager- 100 Centre Street NY, NY/ Clemente Soto Velez NY, NY

- Managed all phases construction project for New York City Department of Design and Construction (DDC) government buildings.
- Estimated time and project cost and monitor workflow to ensure that time and action and cost stayed within or under budget, approving all expenditures and payroll.
- Ensured compliance of contract and government regulations by creating and implementing site-specific quality control plans.

2022- 2023 Blumenfeld Development Group Syosset, NY

Project Manager- The Crossing - Bronx NY

- Collaborate with architects and engineers to create and finalize drawings with scope of work.
- Created cost estimation, budget preparation and bidding of project.
- Awarded the project to the general contractor and finalized the contract.

Project manager - Learning Care Group - Commack NY

- Collaborate with architect and engineers to create drawing, cost estimation and budget preparation.

Project Manager- Islandia Shops Center - Islandia NY

- Oversaw the engineers for bidding and scope of work.
- Hired general contractor for the project and finalized contract.
- Managed the general contractor to upgrade and expand existing Sewer Treatment Plant.

Project Manager- Sun Vet Mall- Holbrook NY

- Oversaw preparation for inception of scope of work, drawings, and site work.

2019 – 2022 The Crest Group LLC Port Jefferson, NY

Senior Project Manager - Setauket Meadows in the Woods – Setauket, NY

- Collaborate with engineer and architect for 92 townhomes of a 55 and better new development which includes interiors and exterior designs, structural, MEP, fire sprinkler, civil, infrastructure and landscaping.
- Compose project planning, cost estimation, budget preparation, bidding, procurement, scheduling, permitting, inspections, quality control, risk management, and project closeout.
- Handle the development and construction, prepare project status reports and recommend the release of construction funds.

Project Manager - Waters Edge Catering Hall – Centerport, NY

- Manage the rebuild and restoration of historic high end 26,000 square foot catering hall formally known as Thatch Cottage.

Project Manager - Beach Path – New York, NY

- Consult the construction of the brand-new ground up 12 story condominium in New York City.
- Prepare Project Status Reports and recommend the release of construction funds.

Project Manager - Marra & Glick Applied Behavior Analysis

- Managed all phases of the expansion and remodel of the special needs facility and assured the facility was compliant with special needs and school building codes.

2015 – 2018 The Beechwood Organization Jericho, NY

Project Manager--Country Pointe Shops

- Involved in the construction and development of the brand-new retail shopping center for Country Pointe Shops in Plainview.
- Managed all scheduling, permitting, inspections, quality control, risk management, and project closeout.
- Managed subcontractors and all resources necessary to develop and complete the site work, infrastructure and landscaping.

Project Manager – Country Pointe Huntington

townhouse development.

- Managed consultants on design build projects, including architectural, structural, MEP, fire sprinkler, infrastructure and landscaping.
- Prepared cost estimates and track financial status of projects and negotiated scopes, specification schedules and contract pricing.
- Directed consultants, subcontractors and all resources necessary to complete all homes within the allotted time frame and budget.
- Ability to build consensus and negotiate with personnel on all levels including clients, design consultants, government officials and construction crews.
- Supervise contract administration activities including change orders, owner billing, payment applications, procurement, subcontractors, schedule and project close out.

- Evaluated projects using foresight, creativity and good judgment to solve unforeseen problems, set priorities and manage competing demands.
- Prepare Project Status Reports and recommend the release of construction funds.

2014 – 2015 ABTS/RBBC Construction Corporation Far Rockaway, NY

Executive Project Manager

- Consulted all phases of the repair and rebuilding of new homes for the New York City Housing Recovery Operations and the Build it Back program in the Far Rockaway and Breezy Point communities effected by Hurricane Sandy.
- Worked closely with architects, homeowners and New York City Department of Housing Preservation and Development (HPD) for architectural design and cost approval to rebuild homes.
- Lead and managed the entire construction process for multiple homes from directing the construction supervisors, running the construction site safety meeting, overseeing all permits, inspections, HPD walkthroughs and Bank Engineering meetings.

Experience cont.

1995–2014 Crescent Street Construction Corporation Long Island City, NY

2004 – 2014 Project Manager

- Managed all phases of multiple multimillion dollar new and rehab construction projects for New York City Department of Housing Preservation and Development (HPD) low-income affordable housing residential and commercial buildings.
- Estimated time and project cost and monitor workflow to assure that time and action and cost stayed within or under budget, approving all expenditures and payroll.
- Ensured compliance of contract and government regulations by creating and implementing site-specific quality control plans.
- Prepared all project documentation from obtaining permits, project schedules, site safety meetings and organized inspections with HPD and New York City Department of Buildings.
- Hired and scheduled subcontractors, third party engineers, testing labs and various utility resources.
- Established and implement policies and procedures which ensure productivity and safety.
- Developed strong employee and sub-contractor relationships, allowing team to provide feedback and proactively identify any potential issues or work hazards and empower the teams to resolve problems immediately.

1998–2003 Construction Supervisor

- Assisted the project manager in managing multiple job sites on all phases to assure that all established time and action plans were implemented.
- Supervised a crew of 50 people and all sub-contractors to guarantee that work was completed as scheduled and implemented quality control plan.
- Ordered and monitored all material for all projects and maintained budget costs.

Education

NYC Technical College Brooklyn, NY

- Studied courses in construction management, strength and materials, surveying, architectural drafting and estimating.

Professional Development

- Completion of Occupational Safety and Health Administration (OSHA) 10 Hour Safety Course.
- Completion of NYC Department of Buildings Site Safety Managers Course.
- Completion of NYC Supported Scaffold Safety Training Course.

Skills

- Construction Management
- Commercial Construction
- New Development Construction
- Rehabilitation Multi-Unit Homes
- Design Build Construction
- Budgets and Contracts
- Problem Solving Skills
- Quality Assurance & Inspection
- Contract Negotiations
- Vendor Supplier Negotiations
- Team Coordination
- Proficient in Microsoft Outlook, Microsoft Word, Microsoft Project, Microsoft Excel, Procore and Bluebeam

Spiros Triantafyllou
30 Sea Cliff Avenue
Sea Cliff, NY 11579

Education

1989-1994 NEW YORK INSTITUTE OF TECHNOLOGY

M.S. Mechanical Engineering
Courses included: Advanced Dynamics, Applied Elasticity, Thermal Stresses and Advanced Thermodynamics.

B.S. Mechanical Engineering/Minor Civil Engineering
Courses included: Strength Materials, Advanced Strength of Materials, Machine Design and Energy Systems.

Qualifications

Strong project and people management background. Proven track record of delivering on both small and large scale projects. Skilled at supervising work of a team of individuals with different levels of skill to enable them to achieve performance and quality standards. Capable and experienced in managing multiple projects. Strong hands on leadership capabilities and professional work ethic. Excellent negotiating skills.

Experience

2006-Present Jobco Inc., New York – Developers,Builders,Engineers, Construction Management
Estimator – Project Manager
Responsible for reviewing potential projects and developing cost analysis/estimates for own Developments (Housing and Commercial) and various bids. Work with consultants and clients to clarify any type of discrepancies. Responsible for selection of subcontractors, materials and all buyouts. Estimates range from $2 - $50 million per project. Projects from both government and private sector.

1996-2006 NSP ENTERPRISES, BROOKLYN NY
Senior Project Manager/Estimator
Primary key person for the selection of projects to bid. Responsibilities included: evaluation of project, review and comment of estimate of bid, as well as placing bid price. Estimator for both small and medium size scale projects (up to $15 million). Contact person between Architects, Engineers, Consultants and Clients to ensure the positive progress of all projects. In charge for selection of subcontractors and materials. Responsible for the supervision of most important projects (Louis Armstrong Museum, Staten Island Borough Hall, NYC Lincoln Center and NYC Fire House). Familiar with building code requirements as well as with controlled inspection requirements. Familiar with most City agencies (DDC, DCAS, NYCHA).

1994-1996 MTA NYC TRANSIT AUTHORITY, NEW YORK
Associate Engineering Technician Lever II
Participated with the Field Support Engineering Department in engineering surveys, collecting field data, inputing data into the CADD system and producing design drawings for track and track switch projects. Assisted the engineering staff in research, extracting pertinent data from various sources and preparation of work schedules. Also, conducted "First Article Inspections" on Track hardware and materials.

1993 DEPT. OF ENVIRONMENTAL PROTECTION, NEW YORK
College intern
Assisted in the water treatment project at Wards Island, NY

Skills **CADD (Microstation for Windows, Microstation 5.0, & Actem 8650, Suretrak, Autocad 2000, COGO 7, Matlab, MS Office 2000.**

July Gonzalez

Jag042490@gmail.com

PROFILE Experienced assistant project manager with previous experience of onsite assistant to site supervisor.

EXPERIENCE

ASSISTANT PROJECT MANAGER

Jobco Incorporated/New Hyde Park, NY *January 2018 – Present*

Responsible for assisting Project Manager planning, executing, and finalizing project(s)' tasks in accordance with project's specifications, schedule and budget • Ordering and scheduling material deliveries to projects and assisting in managing project operations on a day-to-day basis • Assisting Project Manager on finalizing new bids, this includes take offs and estimating • Assisting Project Manager with Account Receivables and Account Payables.

PROJECT ASSISTANT

Special Testing & Consulting LLC, Farmingdale, NY *October 2015 – January 2018*

Responsible for tracking and logging daily scheduled construction inspections • Receive, track, save & distribute daily inspection reports • Create & distribute to clients Non-Conformance Logs & Status Inspection Sheets • Monthly audit inspections of each project • Create & Fedex TR forms for sign ons and sign offs for each project; TR1, TR2, TR8, EN2, BP11 •Assist Operations Supervisor & other team members in office duties.

ADMINISTRATIVE ASSISTANT

The Beechwood Organization, Medford, NY *February 2013 - October 2015*

Responsible to track and log daily phone calls • Track and log incoming invoices from contractors to be process for payment • Keeping schedules of < 4 employees at a time • Responsible of organizing and scheduling inspections with the town inspector and repair appointments with homeowners and contractors • Follow up with both homeowners and contractors on work performed • Schedule walkthrough appointments and prepare all material needed for final walkthrough with future homeowners at two different sites • File and prepare paper work needed for a building permit from the town of Brookhaven - assist expediter gather all paper work • Interact with contractors, other staff personal, and homeowners daily • Run contractors' weekly meeting when site supper not available • Order materials for the office as well as for the field such as; windows, garage motors, mailbox clusters, house electrical & gas meters, etc • For two weeks (while field superintended was away), I was responsible to schedule the subcontractors day to day work in order to keep the homes under construction and completed by the time specified on the contracts between the homeowners and Beechwood. It was a very challenging experience as the daily schedule planned could change within the first hour if something is not completed on time or if a subcontractor cancels his day work last minute. However, I enjoyed this part of the construction field very much & learned to make knowledgeable decisions on the spot as well as it taught me how to prioritize my job load.

EDUCATION

SUNY Farmingdale State College, Farmingdale, NY 11735

B.S. *Construction Management Engineering Technology*, December 2012

- Awarded Golden Key Honor Society
- Awarded Epsilon Pi Tau Honor Society

Nassau Community College, Garden City, NY 11530

A.S.S. *Civil Engineering Technology*, May 2010

- Awarded Phi Theta Kappa Honor Society
- Secretary of Civil Engineering Technology Club

SKILLS Proficient in Civil Engineering and Architectural AutoCad • Proficient in Microsoft Office Word, Excel, Outlook, Powerpoint, and Access • Proficient in Marks System • Fluent in Spanish.

REFERENCES Available upon Request

Stephen Hatzigeorgiou

(917)807-0175 | Shatzigeorgiou@jobco.com | Astoria, NY

Experience

Jobco Incorporated | Lake Success, NY
Superintendent/Project Manager | 07/2022 - Present
Overseeing all aspects of a project, ensuring it runs smoothly, on time, and within budget, including managing project schedules, coordinating subcontractors, maintaining quality control, and ensuring compliance with safety regulations, while demonstrating strong leadership and communication skills to achieve successful project completion.

Demand Electric | Astoria, NY
Project Manager | 08/2019 - 07/2022
Overseeing all aspects of a project, ensuring it runs smoothly, on time, and within budget, including managing project schedules, coordinating employees, procuring materials, maintaining quality control, and ensuring compliance with safety regulations, while demonstrating strong leadership and communication skills to achieve successful project completion.

Jobco Incorporated | Great Neck, NY
Superintendent/Project Manager | 02/2013 - 09/2019
Overseeing all aspects of a project, ensuring it runs smoothly, on time, and within budget, including managing project schedules, coordinating subcontractors, maintaining quality control, and ensuring compliance with safety regulations, while demonstrating strong leadership and communication skills to achieve successful project completion.

Everlast Construction | Astoria, NY
President | 01/2000 - 08/2013
Operator and owner of an Interior renovation construction company. Responsable for management, coordination and complete operations.

Skills

Communication skills, Documentation review, Microsoft word, Leadership, Microsoft excel, English, Bilingual, Coordinator, Organizational Skills, Punctuality

Education

LIC High School | Astoria, NY
High School | 06/1996
High School Diploma.

Department of Design and Construction

PROJECT ID: **LQASADA**

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS

30-30 THOMSON AVENUE
LONG ISLAND CITY, NEW YORK 11101-3045
TELEPHONE (718) 391-1000
WEBSITE www.nyc.gov/ddc

VOLUME 2 OF 3

PROJECT LABOR AGREEMENT
INFORMATION FOR BIDDERS
CONTRACT
PERFORMANCE AND PAYMENT BONDS
SCHEDULE OF PREVAILING WAGES
GENERAL CONDITIONS

FOR FURNISHING ALL LABOR AND MATERIALS
NECESSARY AND REQUIRED FOR THE PROJECT

Astoria Branch Library Renovation

LOCATION: **14-01 Astoria Boulevard**
BOROUGH: **Queens, NY 11102**
CITY OF NEW YORK

CONTRACT NO. 1 **GENERAL CONSTRUCTION WORK**

Queens Public Library

Yoshihara Mckee Architects

Date: **December 3, 2024**

NOTICE TO BIDDERS

Please be advised the Project Labor Agreement (PLA) attached and incorporated in this Invitation for Bids has been extended to apply to contracts let prior to March 31, 2025 including this contract. Other than extending the expiration date, all other terms of the PLA continue to apply in full force and effect.

NOTICE TO BIDDERS

This contract is subject to a new 2020 Project Labor Agreement

This contract is subject to the attached Project Labor Agreement ("PLA") entered into between the City and the Building and Construction Trades Council of Greater New York ("BCTC") affiliated Local Unions. By submitting a bid, the Contractor agrees that if awarded the Contract the PLA is binding on the Contractor and all subcontractors of all tiers.

The bidder to be awarded the contract will be required to execute a Letter of Assent prior to award. The Contractor shall include in any subcontract a requirement that the subcontractor, and sub-subcontractors of all tiers, become signatory to and bound to the PLA with respect to the subcontracted work. The Contractor will also be required to have all subcontractors of all tiers execute a Letter of Assent prior to such subcontractors performing any Program Work.

Bidders are advised that the City of New York and City agencies have entered into multiple PLAs. The terms of each PLA, while similar, are not identical. Please also note that there are revisions between the 2020 Citywide Renovation PLA attached to this bid and the prior 2015 Citywide Renovation PLA.

All bidders are urged to review the entire 2020 Citywide Renovation PLA prior to submitting a bid.

To the extent that the terms of the PLA conflict with any other terms of the invitation for bids, including the Standard Construction Contract, the terms of the PLA shall govern. For example, the PLA section that authorizes the scheduling of a four-day week, ten hours per day on straight time at the commencement of the job, PLA Article 12, Section 1(A), overrides the Standard Construction Contract's provision concerning a five-day work week with a maximum of eight hours in a day, Standard

Construction Contract Article 37.2.1. Where, however, the invitation for bids, including the Standard Construction Contract, requires the approval of the City/Department, the PLA does not supersede or eliminate that requirement.

This Contract is subject to the apprenticeship requirements of Labor Law § 222 and to apprenticeship requirements established by the Department pursuant to Labor Law § 816-b. Please be advised that the involved trades have apprenticeship programs that meet the statutory requirements of Labor Law § 222(e) and the requirements set by the Department pursuant to Labor Law § 816-b, Contractors and subcontractors who agree to perform the Work pursuant to the PLA are participating in such apprenticeship programs within the meaning of Labor Law § 222(e) and the Department's directive.

If this Contract is subject to the Minority-Owned and Women-Owned Business Enterprise ("M/WBE") program implemented pursuant to New York City Administrative Code § 6-129, the specific requirements of M/WBE participation for this Contract are set forth elsewhere in this bid package. If such requirements are included with this Contract, the City strongly advises Contractors to read those provisions, as well as PLA Article 4, Section 4. A list of certified M/WBE firms may be obtained from the Department of Small Business Services (DSBS) website at http://mtprawvwsbswtp1-1.nyc.gov/, emailing MWBE@sbs.nyc.gov, or by calling the DSBS certification hotline at (212) 513-6311, or by visiting or writing the DSBS at One Liberty Plaza, 11th Floor, New York, New York, 10006.

The local collective bargaining agreements (CBAs) that are incorporated into the PLA as PLA Schedule A Agreements are available from the Department's Agency Chief Contract Officer upon the request of any prospective bidder.

Please note that the "PLA Schedule A" is distinct from the Department's Schedule A that is a part of this invitation for bids.

2020 Citywide Renovation Project Labor Agreement
Frequently Asked Questions

1. **Q.** Does a Contractor need to be signatory with the unions in the NYC Building and Construction Trades Council ("BCTC") in order to bid on projects under the PLA?

   A. No, any contractor may bid by signing and agreeing to the terms of the PLA. The contractor need not be signatory with these unions by any other labor agreement or for any other project.

2. **Q.** Does a Contractor agreeing to the PLA and signing the Letter of Assent create a labor agreement with these unions outside of the project covered by the PLA?

   A. No, the PLA applies only to those projects that the Contractor agrees to perform under the PLA and makes no labor agreement beyond those projects. Contractors do not need to sign any additional agreements (*e.g.*, a collective bargaining agreement) with a union aside from the Letter of Assent to work on a PLA project.

3. **Q.** Do the provisions of the PLA apply equally to subcontractors as well as contractors and how does the PLA affect the subcontractors that a bidder may utilize on the project?

   A. Yes, the PLA applies to subcontractors and all subcontractors performing Program Work must agree to become party to the PLA. Subject to the Agency's approval of subcontractors pursuant to Article 17 of the Standard Construction Contract, a Contractor may use any subcontractor, union or non-union, as long as the subcontractor signs the Letter of Assent. See PLA Article 2, Section 8.

4. **Q.** Are bidders required to submit Letters of Assent signed by proposed subcontractors with their bid in order to be found responsive?

   A. No, bidders do not have to submit signed Letters of Assent from their subcontractors with their bid. However, subcontractors performing Program Work will be required to sign the Letter of Assent prior to being approved by the Agency.

5. **Q.** May a Contractor or subcontractor use any of its existing employees to perform this work?

   A. Generally, labor will be referred to the Contractor from the respective signatory local unions. However, Contractors and subcontractors may use up to 12% of their existing, qualifying labor force for this work. Certified M/WBEs for which participation goals are set pursuant to NYC Administrative Code § 6-129 that are not signatory to any Schedule A collective bargaining agreements ("CBAs") may use their existing employees for the 2nd, 4th, 6th and 8th employee (per trade) needed on the job if their contracts are valued at or under $2,000,000. Any additional workers will be referred to the Contractor in accordance with the 12% referral requirements set forth in the PLA. See PLA Article 4, Section 2.

6. **Q.** Must the City set M/WBE participation goals for the particular project or contract in order for a certified M/WBE to utilize the provisions of PLA Article 4, Section 2(C)?

   A. No. PLA Article 4, Section 2(C) specifies what categories of M/WBEs are eligible to take advantage of this provision (i.e., those M/WBEs for which the City is authorized to set participation goals under § 6-129). For purposes of Article 4, Section 2(C), it is not necessary for the project to be subject to § 6-129 or for the City to have actually set participation goals for the particular contract or project. The result is the same where a project receives State funding and therefore is subject to the requirements of Article 15-A of the Executive Law.

7. **Q.** May a Contractor bring in union members from locals that are not signatory unions?

   A. Referrals will be from the respective signatory locals and/or locals listed in Schedule A of the PLA. Contractors may utilize 'traveler provisions' contained in the local CBAs where such provisions exist and/or in accordance with the provisions of PLA Article 4, Section 2.

8. **Q.** Does a non-union employee working under the PLA automatically become a union member?

   A. No, the non-union employee does not automatically become a union member by working on a project covered by the PLA and nothing in the PLA requires employees to join a union or pay dues or fees to a union as a condition of working on the covered project. This Agreement is not, however, intended to supersede independent requirements in applicable local union agreements as to contractors that are otherwise signatory to those agreements and as to employees of such employers performing covered work. Non-union employees will be enrolled in the appropriate benefit plans and earn credit toward various union benefit programs except in certain circumstances as set forth in the PLA. See PLA Article 4, Section 6 and Article 11.

9. **Q.** Are all Contractors and subcontractors working under the PLA, including non-union Contractors and Contractors signatory to CBAs with locals other than those that are signatories to the PLA, required to make contributions to designated employee benefit funds?

   A. Except in certain circumstances, as described in the following paragraph, Contractors and subcontractors working under the PLA will be required to contribute on behalf of all employees covered by the PLA to established jointly trusteed employee benefit funds designated in the Schedule A CBAs and required to be paid on public works under any applicable prevailing wage law. The Agency may withhold from amounts due the Contractor any amounts required to be paid, but not actually paid into any such fund by the Contractor or a subcontractor. See PLA Article 11, Section 2.

   Non-union Contractors with bona fide private benefit plans that satisfy the requirements of Labor Law 220 will not be required to pay into union benefit funds for their employees working pursuant to Article 4, Section 2 (B) and (C) ("Core Employees") who are already covered under their bona fide private benefit plans. Supplemental

benefit funds in excess of the annualized value of the private benefit plans will be paid directly to workers as additional wages in compliance with Labor Law § 220. At the time of contract award, the Contractor shall make available to the contracting Agency a complete set of plan documents for each private benefit plan into which contributions will be made and/or coverage provided. The Contractor shall also provide certification from a certified public accountant as to the annualized hourly value of such benefits consistent with the requirements of Labor Law § 220. See PLA Article 11, Section 2.

10. **Q.** When do Core Employees become eligible for union benefits?

    A. Union benefit plans have their own plan documents that determine eligibility and workers will become eligible for certain benefits at different points in time. Contractors who will have Core Employees should speak with the respective union(s) as to benefit eligibility thresholds. Employees that may remain unaffiliated with any local union at the completion of their employment may apply for any distributions to which they may be entitled from the funds in accordance with the applicable rules and governing documents of the unions and the employee benefit funds.

11. **Q.** What happens if a Contractor or subcontractor fails to make a required payment to a designated employee benefit fund?

    A. The PLA sets forth a process for unions to address a Contractor or a subcontractor's failure to make required payments. The process includes potentially the direct payment by the City to the benefit fund of monies owed and the corresponding withholding of payments to the Contractor. See PLA Article 11, Section 2.

    Upon notification by a union or fringe benefit fund that a Contractor is delinquent in its payment of benefits and a determination by the Agency that the union or fund has submitted appropriate documentation of such delinquency, the Agency will thereafter require the Contractor to submit cancelled checks or other equivalent proof of payment of benefit contributions with certified payroll reports for work covered by this PLA on which the Contractor is engaged.

    The City strongly advises Contractors to read these provisions carefully and to include appropriate provisions in subcontracts addressing these possibilities.

12. **Q.** Does signing on to the PLA satisfy the Apprenticeship Requirements established for this bid?
    A. Yes. By agreeing to perform the Work subject to the PLA, the bidder demonstrates compliance with the apprenticeship requirements imposed by this Invitation for Bids.

13. **Q.** Who decides on the number of workers needed?

    A. Except as expressly limited by a specific provision of the PLA, a Contractor retains full and exclusive authority for the management of their operations, including the determination as to the number of employees to be hired and the qualifications therefore and the promotion, transfer, and layoff of its employees. See PLA Article 6, Section 1.

14. **Q.** What happens if a union does not provide a worker within 48 hours from the request (Saturdays, Sundays, and holidays excepted)?

A. In the event that a Local Union does not fill any request for qualified employees within a 48-hour period after such requisition is made by a Contractor (Saturdays, Sundays and holidays excepted), a Contractor may employ qualified applicants from any other available source.

15. **Q.** May a Contractor discharge a union referral for lack of productivity?

A. Except as expressly limited by a specific provision of the PLA, a Contractor retains full and exclusive authority for the management of their operations, including the right to discipline or discharge for just cause its employees. See PLA Article 6, Section 1.

16. **Q.** May a contractor assign a management person to site?

A. Yes. Managers are not subject to the provisions of the PLA, so there is no restriction on management and/or other non-trade personnel, as long as such personnel do not perform trade functions. See Article 3, Section 1.

17. **Q.** What type of work can Stewards perform?

A. All Stewards must be working Stewards (*i.e.*, they must be performing Program Work). In addition, Stewards may perform other tasks such as receiving complaints or grievances from other employees of the Steward's trade. Stewards may not determine when overtime is worked. Stewards are entitled to the same wages as other employees of that trade. See PLA Article 5, Sections 2 and 3.

18. **Q.** Can a Contractor utilize apprentices?

A. Contractors are permitted to utilize apprentices so long as the ratios between journeyperson and apprentice do not exceed the allowable ratios set by the New York State Department of Labor ("NYSDOL"). Should a Contractor request that apprentices be provided for Program Work, the referring Local Union shall comply with that request so long as it is consistent with the maximum ratios permitted by NYSDOL.

19. **Q.** What is HireNYC Construction Careers?

A. HireNYC Construction Careers is an initiative to advance career opportunities within the construction industry. The initiative has a target goal of 30% of all hours worked on PLA projects are performed by workers who reside in NYCHA housing or zip codes where 15% or more of the residences are below poverty. When a Contractor requests employees, the trades will take into account the target goals when they refer additional workers.

20. **Q.** Does the PLA provide a standard work day across all the signatory trades?

A. Yes, all signatory trades will work an eight (8) hour day, Monday through Friday with a day shift at straight time as the standard work week. The PLA also permits a Contractor to schedule a four-day (within Monday through Friday) work week, ten (10) hours per day at straight time if announced at the commencement of the project. See PLA Article 12, Section 1. This is an example where the terms of the PLA override provisions of the Standard Construction Contract (compare with section 37.2 of the Standard Construction Contract). The standard work week may be reduced to 35 or 37 ½ hours of work in those limited circumstances where the City states in the bid documents that the Contractor will not be given access to the site to accommodate an 8-hour day. The 8 hour, 7 ½ hour or 7-hour work day must be established at the commencement of the project by the Agency and may not be altered by the Contractor.

21. **Q.** Does the PLA create a common holiday schedule for all the signatory trades?

A. Yes, the PLA recognizes nine common holidays. See PLA Article 12, Section 4.

22. **Q.** Are workers entitled to holiday pay if they do not work on the holiday?

A. No. Workers are only entitled to pay if they work on the holiday. See PLA Article 12, Section 4.

23. **Q.** Does the PLA provide for a standard policy for 'shift work' across all signatory trades?

A. Yes, second and third shifts may be worked with a standard 5% premium pay. In addition, a day shift does not have to be scheduled in order to work the second and third shifts at the 1.05 hourly pay rate. See PLA Article 12, Section 3.

24. **Q.** May the Contractor schedule overtime work, including work on a weekend?

A. Yes, the PLA permits the Contractor to schedule overtime work, including work on weekends. See PLA Article 12, Sections 2, 3, and 5. To the extent that the Agency's approval is required before a Contractor may schedule or be paid for overtime, that approval is still required notwithstanding the PLA language.

25. **Q.** Are overtime payments affected by the PLA?

A. Yes, all overtime pay incurred Monday through Saturday will be at time and one half (1 ½). There will be no stacking or pyramiding of overtime pay under any circumstances. See PLA Article 12, Section 2. Sunday and holiday overtime will be paid according to each trade's CBA.

26. **Q.** Are there special provisions for Saturday work when a day is 'lost' during the week due to weather, power failure or other emergency?

A. Yes, when this occurs the Contractor may schedule Saturday work at weekday rates. See PLA Article 12, Section 5.

27. **Q.** Does the PLA contain special provisions for the staffing of temporary services?

A. Yes. Where temporary services are required by specific request of the Agency or construction manager, they shall be provided by the Contractor's existing employees during working hours in which a shift is scheduled for employees of the Contractor. The need for temporary services during non-working hours will be determined by the Agency or construction manager. There will be no stacking of trades on temporary services. See PLA Article 15.

28. **Q.** What do the workers get paid when work is terminated early in a day due to inclement weather or otherwise cut short of 8 hours?

A. The PLA provides that employees who report to work pursuant to regular schedule and not given work will be paid two hours of straight time. Work terminated early for severe weather or emergency conditions will be paid only for time actually worked. In other instances where work is terminated early, the worker will be paid for a full day. See PLA Article 12, Sections 6 and 8. The usual reporting pay requirement of two hours for employees who report to their work location pursuant to their regular schedule does not apply when the National Weather Service issues a Weather Advisory and the Contractor speaks to the employee at least four hours before their shift starting time. See PLA Article 12, Section 6.

29. **Q.** Should a local collective bargaining agreement of a signatory union expire during the project will a work stoppage occur on a project subject to the PLA?

A. No. All the signatory unions are bound by the 'no strike' agreement as to the PLA work. Work will continue under the PLA and the otherwise expired local CBA(s) until the new local CBA(s) are negotiated and in effect. See PLA Articles 7 and 19.

30. **Q.** May a Contractor working under the PLA be subject to a strike or other boycott activity by a signatory union at another site while the Contractor is a signatory to the PLA?

A. Yes. The PLA applies ONLY to work under the PLA and does not regulate labor relations at other sites even if those sites are in close proximity to PLA work.

31. **Q.** If a Contractor has worked under other PLAs in the New York City area, are the provisions in this PLA generally the same as the others?

A. While PLAs often look similar to each other, and particular clauses are often used in multiple agreements, each PLA is a unique document and should be examined accordingly.

32. **Q.** What happens if a dispute occurs between the Contractor and an employee during the project?

A. The PLA contains a grievance and arbitration process to resolve disputes between the Contractor and the employees. See PLA Article 9.

33. **Q.** What happens if there is a dispute between locals as to which local gets to provide employees for a particular project or a particular aspect of a project?

A. The PLA provides for jurisdictional disputes to be resolved in accordance with the NY Plan. A copy of the NY Plan is available upon request from the Agency. The PLA provides that work is not to be disrupted or interrupted pending the resolution of any jurisdictional dispute. The work proceeds as assigned by the Contractor until the dispute is resolved. See PLA Article 10.

34. **Q.** Does the PLA contain special provisions for JOCS or task order-based Contracts?

A. The PLA does not apply to Task Orders or Work Orders that do not exceed $250,000 issued under JOCS or Requirements Contracts. See PLA Article 3, Section 1.

35. **Q.** How do the referral rules work for Operating Engineers Locals 14 and 15?

A. If there is Program Work within the jurisdiction of Operating Engineers Locals 14 or 15, the contractor shall request labor from the appropriate local union. If the locals provide labor consistent with the referral provisions outlined in Article 4, Section 2, the terms of the Local 14 CBA or Local 15 CBA will apply to that work. However, if the locals do not provide labor for that work, the terms of the PLA will apply to such work.

THIS PAGE INTENTIONALLY LEFT BLANK

District Councils & Affiliates Contact Information

Bricklayers & Allied Craftworkers Local 1
4 Court Square
Long Island City, NY 11101
Business Manager: Jack Argila
P: (718) 392-0525
email: jargila@bac1ny.com

BoilerMakers Local 5
24 Van Siclen Avenue
Floral Park, NY 11001
Business Manager: Steve Ludwigson
P: 516-326-2500
email: boilermakerslocal5@verizon.net

Building Concrete & Excavating Laborers Local 731
34-11 35th Avenue
Astoria, NY 11106
Business Manager: Joseph D'Amato
P: 718-706-0720
email: joed731bm@gmail.com

NYC & Vicinity District Council of Carpenters
395 Hudson Street, 9th Fl
New York, NY 10014
Business Manager: Joe Geiger
P: 212-366-7500
email: jgeiger@nycdistrictcouncil.org

Concrete Workers District Council No. 16
30-56 Whitestone Expressway Suite 320
Flushing, NY 11354
Business Manager: Angelo Angelone
P: 718-886-0516
email: ccwdc16@yahoo.com

Cement Masons Local #780
150-50 14th Rd Suite 4
Whitestone, NY 11357
Business Manager: Gino Castingnoli
P: 718-357-3750
email: gcastignoli@noedc.org

Electrical Local 3
158-11 Harry Van Arsdale Jr. Avenue
Flushing, NY 11365
Business Manager: Chris Erikson
P: 718-591-4000
email: cerikson@local3ibew.org

Roofers & Waterproofers Local 8
12-11 43rd Avenue
LIC, NY 11101
Business Manager: Nick Siciliano
P: 718-361-1169
email: nick@fundsforlocal8roofers.org

SheetMetal Workers Local 28
500 Greenwich Street
New York, NY 10013
Business Manager: Eric Meslin
P: 212-941-7700
email: emeslin@local28union.com

SheetMetal Workers Local 137
21-42 44th Drive
LIC, NY 11101
Business Manager: Dante Dano
P: 718-937-4514
email: dante@local137.com

Elevator Constructors Local 1
47-24 27th Avenue
LIC, NY 11101
Business Manager: Lenny Legotte
P: 718-767-7004
email: llegotte@localoneiuec.com

Engineers Local 14
141-57 Northern Boulevard
Flushing, NY 11354
Business Manager: Edwin Christian
P: 718-939-0600
email: lynnd@iuoelocal14.com

Engineers Local 15, 15A, 15B, 15C & 15D
44-40 11th Street
Long Island City, 11101
Business Manager: Tom Callahan
P: 212-929-5327
email: love015@aol.com

Engineers Local 30
16-16 Whitestone Expressway
Whitestone, NY 11357
Business Manager: William Lynn
P: 718-847-8484
email: williamlynn@iuoelocal30.org

Engineers Local 94
331-337 West 44th Street
New York, NY 10036
Business Manager: Kuba Brown
P: 212-245-7040
email: kubabrown@local94.com

Heat & Frost Insulators Local 12
35-53 24th Street
LIC, NY 11101
Business Manager: John Jovic
P: 718-784-3456
email: john@insulatorslocal12.com

Heat & Frost Insulators Local 12A
1536 127th Street
College Point, NY 11356
Business Manager: Jamie Soto
P: 718-886-7226
email: jsoto.12a@aol.com

Steamfitters Local 638
32-32 48th Avenue
LIC, NY 11101
Business Manager: Scott Roche
P: 718-392-3420
email: popparoche@gmail.com

Teamsters Local 282
2500 Marcus Avenue
Lake Success, NY 11042
Business Manager: Tom Gesauldi
P: 516-488-2822 #141
email: tgesualdi282@yahoo.com

Teamsters Local 814
21-42 44th Drive
LIC, NY 11101
Business Manager: Jason Ide
P: 718-609-6407
email: jasonI@ibt814.com

Iron Workers District Council
227 E 56th Street Suite 300A
New York, NY 10022
Business Manager: James Mahoney
P: 212-302-1868
email: jmahoney@iwintl.org

Mason Tenders District Council
520 8th Avenue
New York NY 10018
Business Manager: Robert Bonanza
P: 212-452-9400
email: RBonanza@MasonTenders.org

Painters District Council No. 9
45 West 14th Street
New York, NY 10011
Business Manager: Joe Azzopardi
P: 212-255-2950
email: joeazzo1281@yahoo.com

Pavers & Roadbuilders DC No.1
136-25 37th Avenue, Suite 502
Flushing NY 11354
Business Manager: Keith Lozcalzo
P: 718-886-3310
email: klozcalzo@aol.com

Plasterers Local 262
2241 Conner Streeet
Bronx, NY 10466
Business Manager: Dale Alleyne
P:718-547-5440
email: dalleyne@noedc.org

Plumbers Local 1
50-02 5th Street
Long Island City, NY 11101
Business Manager: Michael Apuzzo
P: 718-738-7500 #5904
email: mapuzzo@ualocal1.org

Private Sanitation Local 813
45-18 Court Square, Suite 600
LIC, NY 11101
Business Manager: Sean Campbell
P: 718-937-7010 ext 244
email: orodriguez@teamsters813.org

Tile Marble & Terrazzo Local 7
45-34 Court Square
LIC, NY 11101
Business Manager: William Hill
P: 718-786-7648
email: whill@baclocal7.com

Window Cleaners No. 2 SEIU 32BJ
101 Avenue of the Americas
New York, NY 10013
Business Manager: Gerard McEneaney
P: 212-539-2904
email: gmceneaney@seiu32bj.org

Carpenters District Council

NYC & Vicinity District Council of Carpenters
395 Hudson Street, 9th Fl
New York, NY 10014
Business Manager: Joe Geiger
P: 212-366-7500

Carpenters Local 20
900 South Avenue
Suite 53
Staten Island, NY 10310

Carpenters Local 45
214-38 Hillside Avenue
Queens Village, NY 11427
P: 718-464-6016

Carpenters Local 157
395 Hudson Street 1st Fl
New York, NY 10014
P: 212-685-0567

Carpenters Local 926
373 96th Street
Brooklyn, NY 11209
P: 718-491-0926

Dockbuilders/Timberman Local 1556
395 Hudson Street 1st Floor
New York, NY 10014

Millwright & Machinery Erectors Local 740
89-07 Atlantic Avenue
Woodhaven, NY 11412
P: 718-849-3636

Concrete Workers District Council No. 16

Concrete Workers District Council No. 16
30-56 Whitestone Expressway Suite 320
Flushing, NY 11354
Business Manager: Angelo Angelone
P: 718-886-36432

Cement & Concrete Workers Local 6A
30-56 Whitestone Expressway
Suite 310
Flushing, NY 11354
Business Manager: Anthony Amella Jr
P: 718-888-9383
email: ccwl6a@aol.com

Cement & Concrete Workers Local 20
36-36 33rd Street
Suite 302
LIC, NY 11106
Business Manager: John Peters
P: 718-361-8131
email: local20@laborerslocal20.org

Cement & Concrete Workers Local 18A
4235 Katonah Avenue
Bronx, NY 10470
Business Manager:Kieran O'Sullivan
P: 718-798-9035
email: local18a@yahoo.com

Iron Workers District Council

Iron Workers District Council
227 E 56th Street Suite 300A
New York, NY 10022
Business Manager: James Mahoney
P: 212-302-1868
email: jmahoney@iwintl.org

IronWorkers Local 361
89-19 97th Avenue
Ozone Park, NY 11416
Business Manager: Matthew Chartrand
P: 718-322-1016/17
email: mchartrand@local361.com

Ironworkers Local 40
451 Park Avenue South
New York, NY 10016
Business Manager: Bob Walsh
P: 212-889-1320
email: bobwalsh@ironworkers.net

Ornamental IronWorkers Local 580
501 West 42nd Street
New York, NY 10036
Business Manager: Pete Myers
p: 212-594-1662
email: pmyers@Local-580.com

Metal Lathers Local 46
1332 Third Avenue
New York, NY 10021
Business Manager:
P: 212-737-0500
email:

Derrickmen & Riggers Local 197
35-53 24th Street
LIC, NY 11106
Business Manager: William Hayes
P: 718-361-6534
email: billhayes197@yahoo.com

Mason Tenders District Council

Mason Tenders District Council
520 8th Avenue
New York NY 10018
Business Manager: Robert Bonanza
P: 212-452-9400
email: RBonanza@MasonTenders.org

Construction & General Laborers Local 79
520 8th Avenue
New York, NY 10018
Business Manager: Michael Prohaska
P: 212-465-7900
email: mpro@laborerslocal79.org

Asbestos Lead & Hazardous Waste Laborers Local 78
30 Cliff Street
New York, NY 10038
Business Manager: Pawell Gruchacz
P: 212-227-4803
email: pgruchacz@local78.org

Painters District Council # 9

**Painters District Council No. 9*
45 West 14th Street
New York, NY 10011
Business Manager: Joseph Azzopardi
P: 212-255-2950

Drywall Tapers Local 1974
265 West 14th Street
New York, NY 10011
Business Manager: Sal Marsala
P: 212-242-8500
email:

Painters Structural Steel Local 806
40 West 27th Street
New York, NY 10001
Business Manager: Brian Casey
P: 212-447-1838/0149
email: bcasey6009@gmail.com

Glaziers Local 1087
45 West 14th Street
New York, NY 10011
Business Manager: Steve Birmingham
P: 212-924-5200
email: bermo1087@gmail.com

Metal Polishers Local 8A-28A
36-18 33rd Street 2nd Floor
LIC, NY 11106
Business Manager:
P: 718-361-1770
email:

PROJECT LABOR AGREEMENT
COVERING SPECIFIED
RENOVATION & REHABILITATION
OF CITY OWNED BUILDINGS AND STRUCTURES

2020 – 2024

TABLE OF CONTENTS

PAGE

ARTICLE 1 - PREAMBLE 1
SECTION 1. PARTIES TO THE AGREEMENT 2
ARTICLE 2 - GENERAL CONDITIONS 2
SECTION 1. DEFINITIONS 2
SECTION 2. CONDITIONS FOR AGREEMENT TO BECOME EFFECTIVE 4
SECTION 3. ENTITIES BOUND & ADMINISTRATION OF AGREEMENT 4
SECTION 4. SUPREMACY CLAUSE 4
SECTION 5. LIABILITY 5
SECTION 6. THE AGENCY 6
SECTION 7. AVAILABILITY AND APPLICABILITY TO ALL SUCCESSFUL BIDDERS 6
SECTION 8. SUBCONTRACTING 6
ARTICLE 3 - SCOPE OF THE AGREEMENT 7
SECTION 1. WORK COVERED 7
SECTION 2. TIME LIMITATIONS 9
SECTION 3. EXCLUDED EMPLOYEES 9
SECTION 4. NON-APPLICATION TO CERTAIN ENTITIES 11
ARTICLE 4 - UNION RECOGNITION AND EMPLOYMENT 11
SECTION 1. PRE-HIRE RECOGNITION 11
SECTION 2. UNION REFERRAL 11
SECTION 3. NON-DISCRIMINATION IN REFERRALS 13
SECTION 4. MINORITY, FEMALE, LOCAL AND SECTION 3 REFERRALS 14
SECTION 5. CROSS AND QUALIFIED REFERRALS 15
SECTION 6. CRAFT FOREPERSONS AND GENERAL FOREPERSONS 15
SECTION 7. ON CALL REPAIR REFERRALS 15
ARTICLE 5 - UNION REPRESENTATION 17
SECTION 1. LOCAL UNION REPRESENTATIVE 17
SECTION 2. STEWARDS 17

SECTION 3. LAYOFF OF A STEWARD 18
ARTICLE 6 - MANAGEMENT'S RIGHTS 18
SECTION 1. RESERVATION OF RIGHTS 18
SECTION 2. MATERIALS, METHODS & EQUIPMENT 19
ARTICLE 7 - WORK STOPPAGES AND LOCKOUTS 20
SECTION 1. NO STRIKES-NO LOCK OUT 20
SECTION 2. DISCHARGE FOR VIOLATION 20
SECTION 3. NOTIFICATION 20
SECTION 4. EXPEDITED ARBITRATION 21
SECTION 5. ARBITRATION OF DISCHARGES FOR VIOLATION 22
ARTICLE 8 - LABOR MANAGEMENT COMMITTEE 23
SECTION 1. SUBJECTS 23
SECTION 2. COMPOSITION 23
ARTICLE 9 - GRIEVANCE & ARBITRATION PROCEDURE 23
SECTION 1. PROCEDURE FOR RESOLUTION OF GRIEVANCES 23
SECTION 2. LIMITATION AS TO RETROACTIVITY 26
SECTION 3. PARTICIPATION BY AGENCY AND/OR CONSTRUCTION MANAGER 26
ARTICLE 10 - JURISDICTIONAL DISPUTES 27
SECTION 1. NO DISRUPTIONS 27
SECTION 2. ASSIGNMENT 27
SECTION 3. NO INTERFERENCE WITH WORK 27
ARTICLE 11 - WAGES AND BENEFITS 27
SECTION 1. CLASSIFICATION AND BASE HOURLY RATE 27
SECTION 2. EMPLOYEE BENEFITS 28
ARTICLE 12 - HOURS OF WORK, PREMIUM PAYMENTS, SHIFTS AND HOLIDAYS 32
SECTION 1. WORK WEEK AND WORKDAY 32
SECTION 2. OVERTIME 33
SECTION 3. SHIFTS 34
SECTION 4. HOLIDAYS 35
SECTION 5. MAKE-UP DAYS 36
SECTION 6. REPORTING PAY 36

SECTION 7. PAYMENT OF WAGES 37
SECTION 8. EMERGENCY WORK SUSPENSION 37
SECTION 9. INJURY/DISABILITY 38
SECTION 10. TIME KEEPING 38
SECTION 11. MEAL PERIOD 38
SECTION 12. BREAK PERIODS 38
ARTICLE 13 - APPRENTICES AND WORKFORCE DEVELOPMENT 39
SECTION 1. APPRENTICE RATIOS AND REFERRALS 39
SECTION 2. WORKFORCE DEVELOPMENT 39
ARTICLE 14 - SAFETY PROTECTION OF PERSON AND PROPERTY 41
SECTION 1. SAFETY REQUIREMENTS 41
SECTION 2. CONTRACTOR RULES 42
SECTION 3. INSPECTIONS 42
ARTICLE 15 - TEMPORARY SERVICES 42
ARTICLE 16 - NO DISCRIMINATION 43
SECTION 1. COOPERATIVE EFFORTS 43
SECTION 2. LANGUAGE OF AGREEMENT 43
ARTICLE 17 - GENERAL TERMS 43
SECTION 1. PROJECT RULES 43
SECTION 2. TOOLS OF THE TRADE 44
SECTION 3. SUPERVISION 44
SECTION 4. TRAVEL ALLOWANCES 44
SECTION 5. FULL WORKDAY 44
SECTION 6. COOPERATION AND WAIVER 44
ARTICLE 18 - SAVINGS AND SEPARABILITY 45
SECTION 1. THIS AGREEMENT 45
SECTION 2. THE BID SPECIFICATIONS 45
SECTION 3. NON-LIABILITY 46
SECTION 4. NON-WAIVER 46
ARTICLE 19 - FUTURE CHANGES IN SCHEDULE “A” AREA CONTRACTS 46
SECTION 1. CHANGES TO AREA CONTRACTS 46
SECTION 2. LABOR DISPUTES DURING AREA CONTRACT

NEGOTIATIONS 47
ARTICLE 20 - WORKERS' COMPENSATION ADR 47
SECTION 1 47
ARTICLE 21 - HELMETS TO HARDHATS 47
SECTION 1 47
SECTION 2 48
SIGNATURE PAGES 54
SCHEDULE "A" - CBAs 84
Exhibit A 89
Project Labor Agreement - Letter of Assent 89
Exhibit B 91
NEW YORK CITY BUILDING AND CONSTRUCTION TRADES COUNCIL STANDARDS OF EXCELLENCE 91
Exhibit C – ZIP CODE LIST 92
Exhibit D – MEMORANDUM OF UNDERSTANDING 917
SCHEDULE "B" - DRUG AND ALCOHOL POLICY 102

PROJECT LABOR AGREEMENT COVERING SPECIFIED RENOVATION & REHABILITATION OF NEW YORK CITY OWNED BUILDINGS & STRUCTURES

ARTICLE 1 - PREAMBLE

WHEREAS, the City of New York desires to provide for the cost efficient, safe, quality, and timely completion of certain rehabilitation and renovation work ("Program Work," as defined in Article 3) in a manner designed to afford the lowest costs to the Agencies covered by this Agreement, and the public it represents, and the advancement of permissible statutory objectives;

WHEREAS, this Project Labor Agreement will foster the achievement of these goals, inter alia, by:

(1) providing a mechanism for responding to the unique construction needs associated with this Program Work and achieving the most cost-effective means of construction, including direct labor cost savings, by the Building and Construction Trades Council of Greater New York and Vicinity and the signatory Local Unions and their members waiving various shift and other hourly premiums and other work and pay practices which would otherwise apply to Program Work;

(2) expediting the construction process and otherwise minimizing the disruption to the covered Agencies' ongoing operations at the facilities that are the subject of the Agreement;

(3) avoiding the costly delays of potential strikes, slowdowns, walkouts, picketing and other disruptions arising from work disputes, reducing jobsite friction on common situs worksites, and promoting labor harmony and peace for the duration of the Program Work;

(4) standardizing the terms and conditions governing the employment of labor on Program Work;

(5) permitting wide flexibility in work scheduling and shift hours and times to allow maximum work to be done during off hours yet at affordable pay rates;

(6) permitting adjustments to work rules and staffing requirements from those which otherwise might obtain;

(7) providing comprehensive and standardized mechanisms for the settlement of work disputes, including those relating to jurisdiction;

(8) fostering increased participation by Minority and Women-owned Business Enterprises ("MWBEs");

(9) encouraging the development of pathways to construction careers;

(10) ensuring a reliable source of skilled and experienced labor; and

(11) securing applicable New York State Labor Law exemptions.

WHEREAS, the Building and Construction Trades Council of Greater New York and Vicinity, its participating affiliated Local Unions and their members, desire to assist the City in meeting these operational needs and objectives as well as to provide for stability, security and work opportunities which are afforded by this Project Labor Agreement; and

WHEREAS, the Parties desire to maximize Program Work safety conditions for both workers and the community in the project area.

NOW, THEREFORE, the Parties enter into this Agreement:

SECTION 1. PARTIES TO THE AGREEMENT

This is a Project Labor Agreement ("Agreement") entered into by the City of New York ("City"), on behalf of itself and the Agencies covered herein, including in their capacity as construction manager of covered projects and/or on behalf of any third party construction manager which may be utilized, and the Building and Construction Trades Council of Greater New York and Vicinity ("Council" or "BCTC") (on behalf of itself) and the signatory affiliated Local Unions ("Unions" or "Local Unions"). The Council and each signatory Local Union hereby warrant and represents that it has been duly authorized to enter into this Agreement.

ARTICLE 2 - GENERAL CONDITIONS

SECTION 1. DEFINITIONS

A. The term "Agency" means the following New York City agencies: the Department for the Aging ("DFTA"), Administration for Children's Services ("ACS"), Department of Citywide Administrative Services ("DCAS"), Department of Correction ("DOC"), Department of Design and Construction ("DDC"), Fire Department ("FDNY"), Department of Homeless Services ("DHS"), Human Resources Administration ("HRA"), Department of Health and Mental Hygiene ("DOHMH"), Department of Parks and Recreation ("DPR"), Police Department ("NYPD"),

Department of Sanitation ("DSNY"); Department of Transportation ("DOT"), Department of Buildings ("DOB"); with respect to Program Work as defined in Article 3, the New York City Agency that awards a particular contract subject to this Agreement may be referred to hereafter as the "Agency";

B. The term "Agreement" means this project labor agreement ("PLA"), the applicable Schedule "A" Collective Bargaining Agreements (each a "CBA") identified in Schedule "A", and each Exhibit hereto;

C. The term "BCTC" refers to the Building and Construction Trades Council of Greater New York and Vicinity. The terms "BCTC" and "Council" are used interchangeably;

D. The term "Contractor(s)" shall include any Construction Manager, General Contractor and all other contractors, and subcontractors of all tiers engaged in Program Work within the scope of this Agreement as defined in Article 3. When an Agency acts as Construction Manager, unless otherwise provided, it has the rights and obligations of a "Construction Manager" in addition to the rights and obligations of an Agency;

E. The term "Core Employee" means an employee that has been on a contractor's payroll consistent with Article 4, Section 2(B) and (C);

F. The term "Minor Repair" means routine repair, service, or maintenance that is recurrent, day to day, periodic scheduled or routine work required to preserve or restore a building, facility or system to working order;

G. The term "HireNYC Construction Careers" refers to the PLA initiative to advance career opportunities for Program Hires;

H. The term "Program Work" is the work covered by this Agreement as defined in Article 3;

I. The term "Program Hire" means an individual that resides in a zip code where at least 15% of the individuals residing in such zip code are below the federal poverty rate and residents of NYCHA housing regardless of zip codes; and

J. The term "Union(s)" or "Local Union(s)" refers to the various participating unions affiliated with the BCTC, singularly and collectively.

SECTION 2. CONDITIONS FOR AGREEMENT TO BECOME EFFECTIVE

This Agreement shall not become effective unless each of the following conditions are met: the Agreement is executed by (1) the Council, on behalf of itself, (2) the participating affiliated Local Unions; and (3) the mayor of the City of New York or their designee.

SECTION 3. ENTITIES BOUND & ADMINISTRATION OF AGREEMENT

This Agreement shall be binding on all participating Unions and their affiliates, the Construction Manager (in its capacity as such) and all Contractors of all tiers performing Program Work, as defined in Article 3. The Contractors shall include in any subcontract that they let for performance during the term of this Agreement a requirement that their subcontractors, of all tiers, become signatory and bound by this Agreement with respect to that subcontracted work falling within the scope of Article 3 and all Contractors (including subcontractors) performing Program Work shall be required to sign a "Letter of Assent" in the form annexed hereto as Exhibit "A". This Agreement shall be administered by the applicable Agency or a Construction Manager or such other designee as may be named by the Agency or Construction Manager, on behalf of all Contractors.

SECTION 4. SUPREMACY CLAUSE

This Agreement, together with the local Collective Bargaining Agreements (each a "CBA") appended hereto as Schedule "A", represents the complete understanding of all signatories and supersedes any national agreement, local agreement or other CBA of any type which would otherwise apply to this Program Work, in whole or in part, except for Program Work which falls

within the jurisdiction of the Operating Engineers Locals 14 and 15. If Program Work falling within the jurisdiction of Operating Engineers Locals 14 and 15 is accepted by and performed by said locals, only then will such work be performed under the terms and conditions set out in the Schedule "A" agreements of Operating Engineers Locals 14 and 15. The CBAs of the affiliated local unions that cover the particular type of construction work to be performed by the contractor, and as set forth in the Schedule "A" list of agreements, shall be deemed the Schedule "A" Collective Bargaining Agreements ("Schedule "A" CBA") under this Agreement. Where association and independent CBAs for a particular type of construction work are both set forth in Schedule "A", association members shall treat the applicable association agreement as the Schedule "A" CBA and independent contractors shall treat the applicable independent agreement as the Schedule "A" CBA. Subject to the foregoing, where a subject covered by the provisions of this project labor agreement is also covered by a Schedule "A" CBA, the provisions of this project labor agreement shall prevail. It is further understood that no Contractor shall be required to sign any other agreement as a condition of performing Program Work. No practice, understanding or agreement between a Contractor and a Local Union which is not set forth in this Agreement shall be binding with respect to Program Work unless endorsed in writing by the Construction Manager or such other designee as may be designated by the Agency. Nothing in this Agreement requires employees to join a union or pay dues or fees to a union as a condition of working on the covered project. This Agreement is not, however, intended to supersede independent requirements in applicable local union agreements as to contractors that are otherwise signatory to those agreements and as to employees of such employers performing covered work.

SECTION 5. LIABILITY

The liability of any Contractor and the liability of any Union under this Agreement shall be several and not joint. The Construction Manager and any Contractor shall not be liable for any

violations of this Agreement by any other Contractor; and the Council and Local Unions shall not be liable for any violations of this Agreement by any other Union.

SECTION 6. THE AGENCY

The Agency (or Construction Manager where applicable) shall require in its bid specifications for all Program Work within the scope of Article 3 that all successful bidders, and their subcontractors of all tiers, become bound by, and signatory to, this Agreement. The Agency (or Construction Manager) shall not be liable for any violation of this Agreement by any Contractor. It is understood that nothing in this Agreement shall be construed as limiting the sole discretion of the Agency or Construction Manager in determining which Contractors shall be awarded contracts for Program Work. It is further understood that the Agency or Construction Manager has sole discretion at any time to terminate, delay or suspend the Program Work, in whole or part, on any project.

SECTION 7. AVAILABILITY AND APPLICABILITY TO ALL SUCCESSFUL BIDDERS

The Unions agree that this Agreement will be made available to, and will fully apply to, any successful bidder for (or subcontractor of) Program Work who becomes signatory thereto, without regard to whether that successful bidder (or subcontractor) performs work at other sites on either a union or non-union basis and without regard to whether employees of such successful bidder (or subcontractor) are, or are not, members of any unions. This Agreement shall not apply to the work of any Contractor which is performed at any location other than the site of Program Work.

SECTION 8. SUBCONTRACTING

Contractors will subcontract Program Work only to a person, firm or corporation who is or agrees to become party to this Agreement.

ARTICLE 3 - SCOPE OF THE AGREEMENT
SECTION 1. WORK COVERED

A. Program Work shall be limited to designated rehabilitation and renovation construction contracts bid and let by an Agency (or its Construction Manager where applicable) after the effective date of this Agreement with respect to rehabilitation and renovation work performed for an Agency on City-owned property under contracts advertised for public solicitation prior to December 31, 2024. Subject to the foregoing, and the exclusions below, such Program Work shall mean any and all contracts that predominantly involve the renovation, alteration, repair, rehabilitation or expansion of an existing City-owned building or structure within the five boroughs of New York City. Examples of Program Work include, but are not limited to, the renovation, repair, alteration and rehabilitation of an existing temporary or permanent structure, or an expansion of above ground structures located in the City on a City-owned building. Program Work shall also include job order contracts ("JOCS"), demolition work, painting services. Low voltage work, site work, elevator work, mold, asbestos and lead abatement, carpentry services, and carpet removal and installation shall be included as Program Work only when incidental to such building renovation and/or rehabilitation of City-owned buildings or structures and included in a contract that predominantly involves such renovation and/or rehabilitation.

B. It is understood that, except where the City specifically applies this Agreement to such work in its bid documents, Program Work does not include, and this Agreement shall not apply to, any other work, including:

1. Contracts that are let under a different project labor agreement with one of the defined City Agencies, and/or other Agencies and Authorities that have entered separate PLAs, such as DEP, NYCHA, H+H and SCA;

2. Contracts let and work performed in connection with projects carried over,

recycled from, or performed under bids or rebids relating to work that were bid prior to the effective date of this Agreement or after December 31, 2024;

3. Contracts procured on an emergency basis;

4. Prime contracts that do not exceed $3,000,000;

5. Contracts for work on streets and bridges and for the closing or environmental remediation of landfills;

6. Contracts with not-for-profit corporations where the City is not awarding or performing the work performed for that entity;

7. Contracts with governmental entities where the City is not awarding or performing the work performed for that entity;

8. Contracts with electric utilities, gas utilities, telephone companies, and railroads, except that it is understood and agreed that these entities may only install their work to a demarcation point, *e.g.*, a telephone closet or utility vault, the location of which is determined prior to construction and employees of such entities shall not be used to replace employees performing Program Work pursuant to this Agreement;

9. Contracts for installation of information technology that are not otherwise Program Work;

10. Task Orders or Work Orders issued under JOCS or Requirements Contracts that do not exceed $250,000, and JOCS or Requirements Contracts where the monetary value of such contracts predominantly involves such Task Orders or Work Orders;

11. Contracts that predominantly involve Minor Repair work, as defined in Article 2, Section 1(F) above. Such work is to be paid under the applicable prevailing wage law for service or maintenance work;

12. Up to five percent (5%) of work performed by certified MWBE

subcontractors on prime contracts that are valued at $25,000,000 or more and for which participation goals are set forth in the contract and where such MWBE subcontractor is not signatory to any Schedule "A" agreement ("Exempt Work"). Exempt Work shall be no more than $500,000 or 15% (whichever is greater) of the value of the subcontracts for work in any particular union's jurisdiction under any prime contract; and

13. On-site work performed on purchased equipment, which is required by the manufacturer to be performed by its staff or by its selected contractors as a condition of the continued effectiveness of the equipment warranty.

SECTION 2. TIME LIMITATIONS

In addition to falling within the scope of Article 3, Section 1, to be covered by this Agreement, Program Work must be (1) advertised and let for bid after the effective date of this Agreement, and (2) let for bid prior to December 31, 2024, the expiration date of this Agreement. It is understood that this Agreement, together with all of its provisions, shall remain in effect for all such Program Work until completion, even if not completed by the expiration date of the Agreement. If Program Work otherwise falling within the scope of Article 3, Section 1 is not let for bid by the expiration date of this Agreement, this Agreement may be extended to that work by mutual agreement of the parties.

SECTION 3. EXCLUDED EMPLOYEES

The following persons are not subject to the provisions of this Agreement, even though performing Program Work:

A. Superintendents, supervisors (except field surveyors on construction contracts, general and forepersons specifically covered by a craft's Schedule "A" agreement are included), engineers, professional engineers and/or licensed architects engaged in inspection and testing, quality control/assurance personnel, timekeepers, mail carriers, clerks, office workers, messengers,

guards, technicians, non-manual employees, and all professional, engineering, administrative and management persons;

B. Employees of the Agency, New York City, or any other municipal or State agency, authority or entity, or employees of any other public employer, even though working on the project site while covered Program Work is underway;

C. Employees and entities engaged in off-site manufacture, modifications, repair, maintenance, assembly, painting, handling or fabrication of project components, materials, equipment or machinery, or involved in deliveries to and from the Program site, except to the extent they are lawfully included in the bargaining unit of a Schedule "A" agreement;

D. Employees of the Construction Manager (except that in the event the Agency engages a Contractor to serve as Construction Manager, then those employees of the Construction Manager performing manual, on site construction labor will be covered by this Agreement);

E. Employees engaged in on-site equipment warranty work including installation, repair or maintenance unless employees are already working on the site and are certified to perform warranty work;

F. Employees engaged in geophysical testing other than boring for core samples;

G. Employees engaged in laboratory, specialty testing, or inspections, pursuant to a professional services agreement between the Agency, or any of the Agency's other professional consultants, and such laboratory, testing, inspection or surveying firms;

H. Employees engaged in on-site maintenance of installed equipment or systems which maintenance is awarded as part of a contract that includes Program Work, but which maintenance occurs after installation of such equipment or system and is not directly related to construction services; and

I. Employees who perform work classified as Minor Repairs, and routine service and/or maintenance work.

SECTION 4. NON-APPLICATION TO CERTAIN ENTITIES

This Agreement shall not apply to those parents, affiliates, subsidiaries, or other joint or sole ventures of any Contractor which do not perform Program Work. It is agreed that this Agreement does not have the effect of creating any joint employment, single employer or alter ego status among the Agency (including in its capacity as Construction Manager) or any Contractor. The Agreement shall further not apply to any New York City or other municipal or State agency, authority, or entity other than a listed Agency and nothing contained herein shall be construed to prohibit or restrict the Agency or its employees, or any State, New York City or other municipal or State authority, agency or entity and its employees, from performing on or off-site work related to Program Work.

As the contracts involving Program Work are completed and accepted, the Agreement shall not have further force or effect on such items or areas except where inspections, additions, repairs, modifications, check-out and/or warranty work are assigned in writing (copy to Local Union involved) by the Agency (or Construction Manager) for performance under the terms of this Agreement.

ARTICLE 4 - UNION RECOGNITION AND EMPLOYMENT

SECTION 1. PRE-HIRE RECOGNITION

The Contractors recognize the signatory Unions as the sole and exclusive bargaining representatives of all employees who are performing on-site Program Work, with respect to that work.

SECTION 2. UNION REFERRAL

A. The Contractors agree to request, employ and hire craft employees, including

Program Hires as defined in Article 2, Section 1(I), for Program Work covered by this Agreement through the job referral systems and hiring halls established in the Local Unions' area CBAs set forth in Schedule "A". Notwithstanding this, Contractors shall have sole right to determine the competency of all referrals; to determine the number of employees required; to select employees for layoff (subject to Article 5, Section 3); and the sole right to reject any applicant referred by a Local Union, subject to the show-up payments. In the event that a Local Union does not fill any request for qualified employees within a 48-hour period after such requisition is made by a Contractor (Saturdays, Sundays and holidays excepted), a Contractor may employ qualified applicants from any other available source. In the event that the Local Union does not have a job referral system, the Contractor shall give the Local Union first preference to refer applicants, subject to the other provisions of this Article. The Contractor shall notify the Local Union of craft employees hired for Program Work within its jurisdiction from any source other than referral by the Union. Any employee hired by a Contractor because a Local Union does not fill a request for qualified employees within a 48 hour period (Saturdays, Sundays and holidays excepted) are not covered by this Agreement for purposes of Article 11, Section 2, unless they are or become a member or agency shop fee payor of an affiliated Union.

B. A Contractor may request by name, and the Local will honor, referral of persons who have applied to the Local for Program Work ("Core Employees") and who meet the following qualifications:

(1) possess any license required by New York State law for the Program Work to be performed;

(2) have worked a total of at least 1000 hours in the Construction field during the prior 3 years; and

(3) were on the Contractor's active payroll for at least 60 out of the 180 calendar days prior to the contract award.

No more than twelve per centum (12%) of the employees covered by this Agreement, per Contractor by craft, shall be hired through the special provisions above. Under this provision, name referrals begin with the eighth employee needed and continue on that same basis.

C. Notwithstanding Section 2(B), above, certified MWBE contractors for which participation goals are set forth in New York City Administrative Code §6-129, that are not signatory to any Schedule "A" CBAs, with subcontracts valued at or under two-million dollars ($2,000,000), may request by name, and the Local will honor, referral of the second (2nd), fourth (4th), sixth (6th), and eighth (8th) Core Employee, who have applied to the Local for Program Work and who meet the following qualifications:

(1) possess any license required by New York State law for the Program Work to be performed;

(2) have worked a total of at least 1000 hours in the Construction field during the prior 3 years; and

(3) were on the Contractor's active payroll for at least 60 out of the 365 calendar days prior to the contract award.

D. Where a certified MWBE Contractor voluntarily enters into a CBA with a BCTC Union, the employees of such Contractor at the time the CBA is executed shall be allowed to join the Union for the applicable trade subject to satisfying the Union's basic standards of proficiency for admission.

SECTION 3. NON-DISCRIMINATION IN REFERRALS

The Council represents that each Local Union hiring hall and referral system will be operated in a non-discriminatory manner and in full compliance with all applicable federal, state and local laws and regulations which require equal employment opportunities. Referrals shall not be affected in any way by the rules, regulations, bylaws, constitutional provisions or any other aspects or obligations of union membership, policies or requirements and shall be subject to such other conditions as are established in this Article. No employment applicant shall be discriminated

against by any referral system or hiring hall because of the applicant's union membership, or lack thereof.

SECTION 4. MINORITY, FEMALE, LOCAL AND SECTION 3 REFERRALS

In the event a Local Union either fails, or is unable to refer qualified minority or female applicants in percentages equaling the workforce participation goals adopted by the City and set forth in the Agency's (or, if applicable, Construction Manager's) bid specifications, within 48 hours of the request for same, the Contractor may employ qualified minority or female applicants from any other available source.

The Local Unions agree to prioritize the referral of Program Hires in accordance with Article 13 and to the extent consistent with the law, rules applicable to the union referral systems and joint apprentice programs. Those unions that do not currently provide for zip code preferences in their referral systems will undertake to implement such preferences consistent with this Agreement and their governing documents. Please see Exhibit "C" for a non-exhaustive list of eligible zip codes. Employees from these zip codes that are already on a contractor's workforce, including Core Employees, and referral of apprentices, in accordance with Article 13, Section 1(A) below, shall count towards the referral goals of this Section.

For any Program Work that may become subject to requirements under Section 3 of the Housing and Urban Development Act of 1968, as amended by the Housing and Community Development Act of 1992, and any rules, including new or revised rules, that may be published thereunder, the Local Unions acknowledge the Section 3 obligations of the Construction Manager or Contractor, as applicable, and agree to the zip code and NYCHA preferences described above to help implement this Article in a manner that would allow the Construction Manager or Contractor to meet its Section 3 obligations to the greatest extent feasible, and to post any required notices in the manner required by Section 3. The parties also acknowledge that the Construction Manager

and Contractor may also fulfill its Section 3 requirements on Program Work by promoting opportunities for excluded employees, as defined by Article 3, Section 3 of this Agreement, on Program Work and, to the extent permitted by Section 3, by promoting opportunities for craft and other employees on non-Program Work.

SECTION 5. CROSS AND QUALIFIED REFERRALS

The Local Unions shall not knowingly refer to a Contractor an employee then employed by another Contractor working under this Agreement. The Local Unions will exert their utmost efforts to recruit sufficient numbers of skilled and qualified crafts employees to fulfill the requirements of the Contractor.

SECTION 6. CRAFT FOREPERSONS AND GENERAL FOREPERSONS

The selection of craft forepersons and/or general forepersons and the number of forepersons required shall be solely the responsibility of the Contractor except where otherwise provided by specific provisions of an applicable Schedule "A" CBA, and provided that all craft forepersons shall be experienced and qualified journeypersons in their trade as determined by the appropriate Local Union. All forepersons shall take orders exclusively from the designated Contractor representatives. Craft forepersons shall be designated as working forepersons at the request of the Contractor, except when an existing local CBA prohibits a foreperson from working when the craft persons, they are leading exceed a specified number.

SECTION 7. ON CALL REPAIR REFERRALS

A. When an Agency awards a contract under this Agreement that requires the Contractor to have employees available on short notice to make time-sensitive repairs with such contract requiring the Contractor to respond within as little as two hours from the time the Contractor is contacted by the Agency ("On Call, Repair Contract"), the Contractor will, within ten (10) days of being awarded an On Call, Repair Contract subject to this Agreement, notify the

appropriate affiliated Union that would perform the work for a contractor that the Contractor has been awarded such a contract and immediately enter into good faith negotiations with such relevant affiliated Union to establish a procedure to receive time sensitive referrals from such affiliated Union(s).

B. In the event the Contractor and the relevant affiliated Union(s) are unable to negotiate a specific, mutually agreeable procedure for on call repair referral procedure within twenty (20) days of commencement of negotiations or prior to commencement of performance of the contract, whichever is earlier, the Contractor and the relevant affiliated Unions will follow the following procedure:

1. Upon notification by a Contractor that it has been awarded an On Call, Repair Contract pursuant to paragraph A above, each relevant affiliate Union shall provide the Contractor with the name and twenty-four (24) hour contact information of an On Call, Repair Contract contact person for urgent on call repair referrals.

2. The relevant affiliated Unions shall prepare a list of individuals eligible and prepared for referral on an immediate basis to respond to the on call repair contractor, which may include the affiliated Unions' service, repair and maintenance division workers where appropriate for repairs that can be made within 24 to 48 hours and paid at the appropriate prevailing wage rates for service and repair or maintenance work. Such list shall be provided to and in the possession of the designated-on call repair contact person for the affiliated Union and available for immediate reference.

3. Individuals on such list must be able to comply with the Contractor's response time pursuant to contract requirements.

4. The Union's On Call, Repair Contract contact person shall respond to a contractor's request for referrals within a reasonable time of the request so that compliance with

the contract shall be possible.

C. In the event that the Contractor makes a request for an on call referral that is compliant with this procedure and a Union is not able to respond to the request, that Union will be deemed to have waived the forty-eight (48) hour referral rule contained in Section 2 above and the Contractor may employ qualified applicants from any other available source that can meet contract requirements for that time-sensitive on call repair work only; provided, however, that any work related to the repair work that is not of a time sensitive nature under the contract shall comply with Section 2. If a Union fails to timely refer a worker and the Contractor employs other workers, the Contractor will e-mail the Agency within 72 hours and the Agency will forward that e-mail to the designated Labor Management Committee contacts.

ARTICLE 5 - UNION REPRESENTATION

SECTION 1. LOCAL UNION REPRESENTATIVE

Each Local Union representing on-site employees shall be entitled to designate in writing (copy to Contractor involved and Construction Manager) one representative, and/or the Business Manager, who shall be afforded access to the Program Worksite during such time as bargaining unit work is occurring and subject to otherwise applicable policies pertaining to visitors to the site.

SECTION 2. STEWARDS

A. Each affiliated Union shall have the sole discretion to designate any journey person as a Steward and an alternate Steward. The Union shall notify the Owner and/or Construction Manager as well as the Contractor of the identity of the designated Steward (and alternate) prior to the assumption of such duties. Stewards shall not exercise supervisory functions and will receive the regular rate of pay for their craft classifications. All Stewards shall be working Stewards.

B. In addition to their work as an employee, the Steward shall have the right to receive complaints or grievances and to discuss and assist in their adjustment with the Contractor's appropriate supervisor. Each Steward shall be concerned with the employees of the Steward's trade and, if applicable, subcontractors of their Contractor, but not with the employees of any other trade Contractor. No Contractor shall discriminate against the Steward in the proper performance of Union duties.

C. The Stewards shall not have the right to determine when overtime shall be worked, or who shall work overtime except pursuant to a Schedule "A" CBA provision providing procedures for the equitable distribution of overtime.

SECTION 3. LAYOFF OF A STEWARD

Contractors agree to notify the appropriate Union 24 hours prior to the layoff of a Steward, except in cases of discipline or discharge for just cause. If a Steward is protected against layoff by a Schedule "A" provision, such provision shall be recognized to the extent the Steward possesses the necessary qualifications to perform the work required, except in cases of discipline or discharge for just cause. In any case in which a Steward is discharged or disciplined for just cause, the Local Union involved shall be notified immediately by the Contractor.

ARTICLE 6 - MANAGEMENT'S RIGHTS

SECTION 1. RESERVATION OF RIGHTS

Except as expressly limited by a specific provision of this Agreement, Contractors retain full and exclusive authority for the management of their operations including, but not limited to, the right to: direct the work force, including determination as to the number of employees to be hired and the qualifications therefore; the promotion, transfer, layoff of its employees; require compliance with the directives of the Agency including standard restrictions related to security and access to the site that are equally applicable to Agency employees, guests, or vendors; or the discipline or discharge for just cause of its employees; assign and schedule work; promulgate

reasonable Program Work rules that are not inconsistent with this Agreement or rules common in the industry and are reasonably related to the nature of work; and, the requirement, timing and number of employees to be utilized for overtime work. No rules, customs, or practices which limit or restrict productivity or efficiency of the individual, as determined by the Contractor, Agency and/or Construction Manager and/or joint working efforts with other employees shall be permitted or observed.

SECTION 2. MATERIALS, METHODS & EQUIPMENT

There shall be no limitation or restriction upon the Contractor's choice of materials, techniques, methods, technology or design, or, regardless of source or location, upon the use and installation of equipment, machinery, package units, pre-cast, pre-fabricated, pre-finished, or pre-assembled materials or products, tools, or other labor-saving devices. Contractors may, without restriction, install or use materials, supplies or equipment regardless of their source; provided, however, that where there is a Schedule "A" that includes a lawful union standards and practices clauses, then such clause as set forth in Schedule "A" agreements will be complied with, unless there is a lawful Agency specification (or specification issued by a Construction Manager which would be lawful if issued by the Agency directly) that would specifically limit or restrict the Contractor's choice of materials, techniques, methods, technology or design, or, regardless of source or location, upon the use and installation of equipment, machinery, package units, pre-cast, pre-fabricated, pre-finished, or pre-assembled materials or products, tools, or other labor-saving devices, and which would prevent compliance with such Schedule "A" clause. The on-site installation or application of such items shall be performed by the craft having jurisdiction over such work; provided, however, it is recognized that other personnel having special qualifications may participate, in a supervisory capacity, in the installation, check-off or testing of specialized or

unusual equipment or facilities as designated by the Contractor. There shall be no restrictions as to work which is performed off-site for Program Work.

ARTICLE 7 - WORK STOPPAGES AND LOCKOUTS

SECTION 1. NO STRIKES-NO LOCK OUT

There shall be no strikes, sympathy strikes, picketing, work stoppages, slowdowns, hand billing, demonstrations or other similar disruptive activity at the Program Work site for any reason by any Union or employee against any Contractor or employer. There shall be no other Union or concerted or employee activity which disrupts or interferes with the operation of the Program Work or the objectives of the Agency at any Program Work site. In addition, failure of any Union or employee to cross any picket line established by any Union, signatory or non-signatory to this Agreement, or the picket or demonstration line of any other organization, at or in proximity to a Program Work site where the failure to cross disrupts or interferes with the operation of Program Work is a violation of this Article. Should any employees breach this provision, the Unions will use their best efforts to try to immediately end that breach and return all employees to work. There shall be no lockout at a Program Work site by any signatory Contractor, Agency or Construction Manager.

SECTION 2. DISCHARGE FOR VIOLATION

A Contractor may discharge any employee violating Section 1, above, and any such employee will not be eligible thereafter for referral under this Agreement for a period of 100 days.

SECTION 3. NOTIFICATION

If a Contractor contends that any Union has violated this Article, it will notify the Local Union involved advising of such fact, with copies of the notification to the Council. The Local Union shall instruct and order, the Council shall request, and each shall otherwise use their best efforts to cause, the employees (and where necessary the Council shall use its best efforts to cause the Local Union), to immediately cease and desist from any violation of this Article. If the Council

complies with these obligations, it shall not be liable for the unauthorized acts of a Local Union or its members. Similarly, a Local Union and its members will not be liable for any unauthorized acts of the Council. Failure of a Contractor or the Construction Manager to give any notification set forth in this Article shall not excuse any violation of Section 1 of this Article.

SECTION 4. EXPEDITED ARBITRATION

Any Contractor or Union alleging a violation of Section 1 of this Article may utilize the expedited procedure set forth below (in lieu of, or in addition to, any actions at law or equity that may be brought).

A. A party invoking this procedure shall notify J.J. Pierson or Richard Adelman; who shall alternate (beginning with Arbitrator J.J. Pierson) as Arbitrator under this expedited arbitration procedure. If the Arbitrator next on the list is not available to hear the matter within 24 hours of notice, the next Arbitrator on the list shall be called. Copies of such notification will be simultaneously sent to the alleged violator and Council.

B. The Arbitrator shall thereupon, after notice as to time and place to the Contractor, the Local Union involved, the Council and the Construction Manager, hold a hearing within 48 hours of receipt of the notice invoking the procedure if it is contended that the violation still exists. The hearing will not, however, be scheduled for less than 24 hours after the notice required by Section 3, above.

C. All notices pursuant to this Article may be provided by telephone, telegraph, hand delivery, or fax, confirmed by overnight delivery, to the Arbitrator, Contractor, Construction Manager and Local Union involved. The hearing may be held on any day including Saturdays or Sundays. The hearing shall be completed in one session, which shall not exceed 8 hours duration (no more than 4 hours being allowed to either side to present their case and conduct their cross examination) unless otherwise agreed. A failure of any Union or Contractor to attend the hearing

shall not delay the hearing of evidence by those present or the issuance of an award by the Arbitrator.

D. The sole issue at the hearing shall be whether a violation of Section 1, above, occurred. If a violation is found to have occurred, the Arbitrator shall issue a Cease and Desist Award restraining such violation and serve copies on the Contractor and Union involved. The Arbitrator shall have no authority to consider any matter in justification, explanation or mitigation of such violation or to award damages (any damages issue is reserved solely for court proceedings, if any). The Award shall be issued in writing within 3 hours after the close of the hearing and may be issued without an Opinion. If any involved party desires an Opinion, one shall be issued within 15 calendar days, but its issuance shall not delay compliance with, or enforcement of, the Award.

E. The Agency and Construction Manager (or such other designee of the Agency) may participate in full in all proceedings under this Article.

F. An Award issued under this procedure may be enforced by any court of competent jurisdiction upon the filing of this Agreement together with the Award. Notice of the filing of such enforcement proceedings shall be given to the Union or Contractor involved, and the Construction Manager.

G. Any rights created by statute or law governing arbitration proceedings which are inconsistent with the procedure set forth in this Article, or which interfere with compliance thereto, are hereby waived by the Contractors and Unions to whom they accrue.

H. The fees and expenses of the Arbitrator shall be equally divided between the involved Contractor and Union.

SECTION 5. ARBITRATION OF DISCHARGES FOR VIOLATION

Procedures contained in Article 9 shall not be applicable to any alleged violation of this Article, with the single exception that an employee discharged for violation of Section 1, above,

may have recourse to the procedures of Article 9 to determine only if the employee did, in fact, violate the provisions of Section 1 of this Article; but not for the purpose of modifying the discipline imposed where a violation is found to have occurred.

ARTICLE 8 - LABOR MANAGEMENT COMMITTEE

SECTION 1. SUBJECTS

The Program Labor Management Committee (the "LMC") will meet on a regular basis to: 1) promote harmonious relations among the Contractors and Unions; 2) enhance safety awareness, cost effectiveness and productivity of construction operations; 3) protect the public interests; 4) discuss matters relating to staffing and scheduling with safety and productivity as considerations; and 5) review efforts to meet applicable participation goals for MWBEs and workforce participation goals for Program Hires, minority and female employees.

SECTION 2. COMPOSITION

The LMC shall be jointly chaired by a designee of the Agency and the President of the Council. It may include representatives of the Local Unions and Contractors involved in the issues being discussed. The parties shall mutually designate an MWBE representative to participate in appropriate Committee discussions. The Committee may conduct business through mutually agreed upon sub-committees.

ARTICLE 9 - GRIEVANCE & ARBITRATION PROCEDURE

SECTION 1. PROCEDURE FOR RESOLUTION OF GRIEVANCES

Any question, dispute or claim arising out of, or involving the interpretation or application of this Agreement (other than jurisdictional disputes or alleged violations of Article 7, Section 1) shall be considered a grievance and shall be resolved pursuant to the exclusive procedure of the steps described below, provided, in all cases, that the question, dispute or claim arose during the term of this Agreement. Grievances shall include the City contract number and the Program Work

address; such information is posted at the work site if already commenced and is available in the City Record and Notice to Proceed for projects not already commenced.

Local Union grievances as to whether a scope of work is included or excluded from this Agreement shall be submitted to the LMC in the first instance rather than Step 1 below. To be timely, such notice must be given no later than five days prior to the bid opening date advertised in the City Record and bid documents for that contract, or any adjourned date publicly noticed if the grievance is challenging a determination by an Agency that the contract is not subject to this Agreement. Compliance with this limit shall operate as a statute of limitations and shall be a condition precedent to arbitration. For other grievances as to contractor and/or subcontractor scope of work issues, notice of such challenges shall be submitted to the LMC within 7 calendar days after the act, occurrence or event giving rise to the grievance. If the scope of work grievance is not resolved within 21 days of its submission to the LMC, then the grievance may proceed directly to Step 3 below.

Step 1:

(a) When any employee covered by this Agreement feels aggrieved by a claimed violation of this Agreement, the employee shall, through the Local Union business representative or job steward give notice of the claimed violation to the work site representative of the involved Contractor and the Construction Manager. To be timely, such notice of the grievance must be given within 7 calendar days after the act, occurrence or event giving rise to the grievance. The business representative of the Local Union or the job steward and the work site representative of the involved Contractor shall meet and endeavor to adjust the matter within 7 calendar days after timely notice has been given. If they fail to resolve the matter within the prescribed period, the grieving party, may, within 7 calendar days thereafter, pursue Step 2 of the grievance procedure by serving the involved Contractor with written copies of the grievance setting forth a description of the claimed

violation, the date on which the grievance occurred, and the provisions of the Agreement alleged to have been violated. Grievances and disputes settled at Step 1 are non-precedential except as to the specific Local Union, employee and Contractor directly involved unless the settlement is accepted in writing by the Construction Manager (or designee) as creating a precedent.

(b) Should any signatory to this Agreement have a dispute (excepting jurisdictional disputes or alleged violations of Article 7, Section 1) with any other signatory to this Agreement and, if after conferring, a settlement is not reached within 7 calendar days, the dispute shall be reduced to writing and proceed to Step 2 in the same manner as outlined in subparagraph (a) for the adjustment of employee grievances.

Step 2:

A Step 2 grievance shall be filed with the Agency, the BCTC, the Contractor, and, if the grievance is against a subcontractor, the subcontractor. The Business Manager or designee of the involved Local Union, together with representatives of the involved Contractor and/or a contractor association representative where appropriate, Council, the Construction Manager (or designee), and, if the grievance is against a subcontractor, the subcontractor, shall meet in Step 2 within 7 calendar days of service of the written grievance to arrive at a satisfactory settlement. The BCTC shall schedule the Step 2 meeting.

Step 3:

(a) If the grievance shall have been submitted but not resolved in Step 2, any of the participating Step 2 entities may, within 21 calendar days after the initial Step 2 meeting, submit the grievance in writing (copies to other participants, including the Construction Manager or designee) to the BCTC. In the event the matter is not resolved at Step 2, either J.J. Pierson or Richard Adelman, who shall act, alternately (beginning with Arbitrator J.J. Pierson), as the Arbitrator under this procedure, shall be designated at the Step 2 hearing and the BCTC will notify

the arbitrator of his designation. After such notification by the BCTC, the local demanding arbitration shall within a reasonable time request the arbitrator to schedule the matter for an arbitration hearing date. The Labor Arbitration Rules of the American Arbitration Association shall govern the conduct of the arbitration hearing, at which all Step 2 participants shall be parties. The decision of the Arbitrator shall be final and binding on the involved Contractor, Local Union and employees and the fees and expenses of such arbitrations shall be borne equally by the involved Contractor and Local Union.

(b) Failure of the grieving party to adhere to the time limits set forth in this Article shall render the grievance null and void. These time limits may be extended only by written consent of the Construction Manager (or designee), involved Contractor and involved Local Union at the particular step where the extension is agreed upon. The Arbitrator shall have authority to make decisions only on the issues presented to him and shall not have the authority to change, add to, delete or modify any provision of this Agreement.

SECTION 2. LIMITATION AS TO RETROACTIVITY

No arbitration decision or award, with the exception of those related to compliance with requirements to pay prevailing wages and supplements in accordance with federal or State law, may provide retroactivity of any kind exceeding 60 calendar days prior to the date of service of the written grievance on the Construction Manager and the involved Contractor or Local Union.

SECTION 3. PARTICIPATION BY AGENCY AND/OR CONSTRUCTION MANAGER

The Agency and Construction Manager (or such other designee of the Agency) shall be notified by the involved Contractor of all actions at Steps 2 and 3 and, at its election, may participate in full in all proceedings at these Steps, including Step 3 arbitration.

ARTICLE 10 - JURISDICTIONAL DISPUTES

SECTION 1. NO DISRUPTIONS

There will be no strikes, sympathy strikes, work stoppages, slowdowns, picketing or other disruptive activity of any kind arising out of any jurisdictional dispute. Pending the resolution of the dispute, the work shall continue uninterrupted and as assigned by the Contractor. No jurisdictional dispute shall excuse a violation of Article 7.

SECTION 2. ASSIGNMENT

All Program Work assignments shall be made by the Contractor to unions affiliated with the BCTC consistent with the New York Plan for the Settlement of Jurisdictional Disputes ("New York Plan") and its Greenbook decisions, if any. Where there are no applicable Greenbook decisions, assignments shall be made in accordance with the provisions of the New York Plan and local industry practice.

SECTION 3. NO INTERFERENCE WITH WORK

There shall be no interference or interruption of any kind with the Program Work while any jurisdictional dispute is being resolved. The work shall proceed as assigned by the Contractor until finally resolved under the applicable procedure of this Article. The award shall be confirmed in writing to the involved parties. There shall be no strike, work stoppage or interruption in protest of any such award.

ARTICLE 11 - WAGES AND BENEFITS

SECTION 1. CLASSIFICATION AND BASE HOURLY RATE

All employees covered by this Agreement shall be classified in accordance with the work performed and paid the hourly wage rates applicable for those classifications as required by the applicable prevailing wage laws.

SECTION 2. EMPLOYEE BENEFITS

A. The Contractors agree to pay on a timely basis contributions on behalf of all employees covered by this Agreement to those established jointly trusteed employee benefit funds designated in the applicable CBA in Schedule "A" (in the appropriate Schedule "A" amounts), provided that such benefits are required to be paid on public works under any applicable prevailing wage law. Bona fide jointly trusteed fringe benefit plans established or negotiated through collective bargaining during the life of this Agreement may be added if similarly required under applicable prevailing wage law. Contractors, not otherwise contractually bound to do so, shall not be required to contribute to benefits, trusts or plans of any kind which are not required by the prevailing wage law provided, however, that this provision does not relieve Contractors signatory to local collective bargaining agreement with any affiliated union from complying with the fringe benefit requirements for all funds contained in the CBA. Furthermore, employees that may remain unaffiliated with any local union at the completion of their employment under the terms of this Agreement may apply for any distributions to which they may be entitled from the funds in accordance with the applicable rules and governing documents of the unions and the employee benefit funds that they have participated in under the terms of this Agreement.

B. 1. Notwithstanding Section 2 (A) above, and subject to 2 (B)(2) below, Contractors who designate Core Employees pursuant to Article 4, Section 2 (B) and (C) that are not signatory to a Schedule "A" agreement and who maintain bona fide private benefit plans that satisfy the requirements of Section 220 of the New York State Labor Law, may satisfy the above benefit obligation with respect to those employees by providing those employees with coverage under their private benefit plans (to the extent consistent with Section 220). The total benefit payments to be made on behalf of each such employee must be equal to the total Section 220 supplement amount and any shortfall must be paid by cash supplement to the employee.

2. A contractor that will satisfy its Section 220 obligations in accordance with subsection 2(B)(1) above shall make available to the Agency at the time of contract award a complete set of plan documents for each non-Schedule "A" benefit plan into which contributions will be made and/or coverage provided pursuant to the provisions of Section 2(B)(l) above. The Contractor shall also provide certification from a certified public accountant as to the annualized hourly value of such benefits consistent with the requirements of Section 220.

3. The City shall verify that the alternate benefit plan(s), together with any cash supplement to the employee, is compliant with Section 220 prior to awarding the Contractor a contract covered by this Agreement. In the event the Contractor's alternate benefit plan(s), together with any cash supplement to the employee, is determined to be compliant with Section 220 and will be utilized by the Contractor on behalf of Article 4, Section 2(B) and (C) Core Employees, the Local Unions have no duty to enforce the Contractor's obligations on the alternate benefit plan(s) as they are not party to the alternate plan(s) or privy to the terms and conditions of the plan obligations. In the event the City determines the alternate benefit plan(s), together with any cash supplement to the employee, is not compliant with Section 220, the Contractor may, upon executing a Letter of Assent, satisfy its obligations for all employees, including Core Employees, by contributing to the Schedule "A" benefit plans in accordance with the terms of the Schedule "A" agreements.

C. The Contractors agree to be bound by the written terms of the legally established jointly trusteed Trust Agreements specifying the detailed basis on which payments are to be paid into, and benefits paid out of, such Trust Funds but only with regard to Program Work done under this Agreement and only for those employees to whom this Agreement requires such benefit payments.

D. 1. To the extent consistent with New York City's Procurement Policy Board Rules with respect to prompt payment, as published at www.nyc.gov/ppb, §4-06(e), and in consideration of the unions' waiver of their rights to withhold labor from a contractor or subcontractor delinquent in the payment of fringe benefits contributions ("Delinquent Contractor"); the Agency agrees that where any such union and/or fringe benefit fund shall notify the Agency, the General Contractor, and the Delinquent Contractor in writing with back-up documentation that the Delinquent Contractor has failed to make fringe benefit contributions to it as provided herein and the Delinquent Contractor shall fail, within ten (10) calendar days after receipt of such notice, to furnish either proof of such payment or notice that the amount claimed by the union and/or fringe benefit fund is in dispute, the Agency shall withhold from amounts then or thereafter becoming due and payable to the General Contractor an amount equal to that portion of such payment due to the General Contractor that relates solely to the work performed by the Delinquent Contractor which the union or fringe benefit fund claims to be due it, and shall remit the amount when and so withheld to the fringe benefit fund and deduct such payment from the amounts then otherwise due and payable to the General Contractor, which payment shall, as between the General Contractor and the Agency, be deemed a payment by the Agency to the General Contractor; provided however, that in any month, such withholding shall not exceed the amount contained in the General Contractor's monthly invoice for work performed by the Delinquent Contractor. The union or its employee benefit funds shall include in its notification of delinquent payment of fringe benefits only such amount it asserts the Delinquent Contractor failed to pay on the specific project against which the claim is made and the union or its employee benefit funds may not include in such notification any amount such Delinquent Contractor may have failed to pay on any other City or non-City project.

2. In addition, where a union or employee benefit fund gives notice to the City that a Contractor is Delinquent as defined in subsection 2(D)(1) above and the City determines that the

notice includes appropriate back-up documentation that the Contractor is delinquent, the City will promptly, but not later than twenty (20) days after receipt of the notice, provide a copy of said notice to City Agencies. In the event the City determines there is insufficient back-up documentation, it will notify the appropriate union and/or fringe benefit fund promptly, but not later than twenty (20) days after receipt of the Delinquency Notice, and shall include notice of what additional documentation is requested. Any determination by the City that there is insufficient back-up must be reasonable. This provision is intended to enhance compliance with the prevailing wage law and this Agreement with respect to the payment of fringe benefits and is not intended as a substitute for the resolution of a disputed claim pursuant to any applicable law or agreement.

The City and the relevant Agency(s) will thereafter require the Delinquent Contractor to provide cancelled checks or other equivalent proof of payment of benefit contributions that have come due, to be submitted with certified payroll reports for all Program Work covered by this Agreement on which the Delinquent Contractor is engaged, for at least a one-year period or such earlier period if the Contractor is ultimately determined not to be a Delinquent Contractor. Such proof of payment when required is a condition of payment of the Delinquent Contractor's invoices by any entity, including, but not limited to, the City, the relevant Agency(s), Construction Manager, General Contractor, the prime or higher level subcontractor, as is appropriate under the Delinquent Contractor's engagement. The union and the funds shall upon request receive copies of the certified payrolls, cancelled checks, or other proof of payment from the City and/or the relevant Agency(s).

E. In the event the General Contractor or Delinquent Contractor shall notify the Agency as above provided that the claim of the union or fringe benefit fund is in dispute, the Agency shall withhold from amounts then or thereafter becoming due and payable to the General Contractor an amount equal to that portion of such payment due to the General Contractor that relates solely to the work performed by the Delinquent Contractor that the union and/or fringe benefit fund claims

to be due it, pending resolution of the dispute pursuant to the union's Schedule "A" agreement, and the amount shall be paid to the party or parties ultimately determined to be entitled thereto, or held until the Delinquent Contractor and union or employee benefit fund shall otherwise agree as to the disposition thereof; provided however, that such withholding shall not exceed the amount contained in the General Contractor's monthly invoice for work performed by the Delinquent Contractor. In the event the Agency shall be required to withhold amounts from a General Contractor for the benefit of more than one fringe benefit fund, the amounts so withheld in the manner and amount prescribed above shall be applied to or for such fund in the order in which the written notices of nonpayment have been received by the Agency, and if more than one such notice was received on the same day, proportionately based upon the amount of the union and/or fringe benefit fund claims received on such day. Nothing herein contained shall prevent the Agency from commencing an interpleader action to determine entitlement to a disputed payment in accordance with section one thousand six of the civil practice law and rules or any successor provision thereto.

F. Payment to a fringe benefit fund under this provision shall not relieve the General Contractor or Delinquent Contractor from responsibility for the work covered by the payment. Except as otherwise provided, nothing contained herein shall create any obligation on the part of the Agency to pay any union or fringe benefit fund, nor shall anything provided herein serve to create any relationship in contract or otherwise, implied or expressed, between the union/fund and/or fringe benefit and the Agency.

ARTICLE 12 - HOURS OF WORK, PREMIUM PAYMENTS, SHIFTS AND HOLIDAYS

SECTION 1. WORK WEEK AND WORKDAY

A. The standard work week shall consist of 40 hours of work at straight time rates, Monday through Friday, 8 hours per day, plus ½ hour unpaid lunch period. The standard work week may be reduced to 35 or 37 ½ hours of work at straight time rates, Monday to Friday, 7 or 7

½ hours per day, plus ½ hour unpaid lunch period in those limited circumstances where the City states in the bid documents that the Contractor will not be given access to the site to accommodate an 8 hour day. The 8 hour, 7 ½ hour or 7-hour workday must be established at the commencement of the project and may not be altered by the Contractor.

B. In accordance with project needs, there shall be flexible start times with advance notice from Contractor to the Union. The Day Shift shall commence between the hours of 6:00 a.m. and 9:00 a.m. and shall end between the hours of 2:30 p.m. and 5:30 p.m., for an 8-hour day, and up to 7:30 p.m. for a 10-hour day. The Evening Shift shall commence between the hours of 3:00 p.m. and 6:00 p.m., unless different times are necessitated by the Agency's phasing plans on specific projects. The Night Shift shall commence between the hours of 11:00 p.m. and 2:00 a.m., unless different times are necessitated by the Agency's phasing plans on specific projects. Subject to the foregoing, starting and quitting times shall occur at the Program Work site designated by the Contractor.

C. Scheduling - Except as provided above, Monday through Friday is the standard work week; 8 hours of work plus ½ hour unpaid lunch. Notwithstanding any other provision of this Agreement, a Contractor may schedule a four-day work week, 10 hours per day ("4/10") at straight time rates, plus a ½ hour unpaid lunch, at the commencement of the job.

D. Notice - Contractors shall provide not less than 5 days prior notice to the Local Union involved as to the work week and work hour schedules to be worked or such lesser notice as may be mutually agreed upon.

SECTION 2. OVERTIME

Overtime shall be paid for any work (i) over an employee's regularly scheduled work day, i.e., work over eight (8) hours in a day where 5/8s is scheduled, work over ten (10) hours in a day where 4/10s is scheduled, or work over seven (7) or seven and one half (7½) hours where such

hours are scheduled pursuant to Article 12, section 1(A) and (ii) over forty (40) hours in a week, or over thirty five (35) or thirty seven and one-half (37 ½) where such hours are scheduled pursuant to Article 12, section 1(A). Overtime shall be paid at time and one half (1½) Monday through Saturday. All overtime work performed on Sunday and Holidays will be paid pursuant to the applicable Schedule "A". There shall be no stacking or pyramiding of overtime pay under any circumstances. There will be no restriction upon the Contractor's scheduling of overtime or the nondiscriminatory designation of employees who shall be worked, including the use of employees, other than those who have worked the regular or scheduled work week, at straight time rates. The Contractor shall have the right to schedule work so as to minimize overtime or schedule overtime as to some, but not all, of the crafts and whether or not of a continuous nature.

SECTION 3. SHIFTS

A. Flexible Schedules - Scheduling of shift work, including Saturday and Sunday work, shall be within the discretion of the Contractor in order to meet Program Work schedules and existing Program Work conditions including the minimization of interference with the mission of the Agency. It is not necessary to work a day shift in order to schedule a second or third shift, or a second shift in order to schedule a third shift, or to schedule all of the crafts when only certain crafts or employees are needed. Shifts must have prior approval of the Agency or Construction Manager and must be scheduled with not less than five workdays' notice to the Local Union or such lesser notice as may be mutually agreed upon.

B. Second and/or Third Shifts - The second shift shall start between 3 p.m. and 6 p.m. and the third shift shall start between 10 p.m. and 2 a.m., subject to different times necessitated by the Agency phasing plans on specific projects. There shall be no reduction in shift hour work. With respect to second and third shift work there shall be a 5% shift premium, or the rate required by the applicable prevailing wage laws, whichever is less. No other premium or other payments for such

work shall be required unless such work is in excess of the employee's regularly scheduled work week, i.e., forty (40) hours in the week or thirty five (35) or thirty seven and one half (37 ½) pursuant to Article 12, Section 1(A). All employees within the same classification performing Program Work will be paid at the same wage rate regardless of the shift or work, subject only to the foregoing provisions.

C. Flexible Starting Times - Shift starting times will be adjusted by the Contractor as necessary to fulfill Program Work requirements subject to the notice requirements of paragraph A.

SECTION 4. HOLIDAYS

A. Schedule - There shall be nine (9) recognized holidays on the project:

New Year's Day	
Martin Luther King Day	President's Day
Memorial Day	Veteran's Day
Labor Day	Thanksgiving Day
Independence Day	Christmas Day

All said holidays shall be observed on the calendar date except those holidays which occur on Saturday shall be observed on the previous Friday and those that occur on Sunday shall be observed on the following Monday.

B. Payment - Regular holiday pay, if any, for work performed on such a PLA recognized holiday shall be in accordance with the applicable Schedule "A" for work performed on a holiday, even where the PLA holiday differs from the CBA holidays.

C. Exclusivity - No holidays other than those listed in Section 4(A) above shall be recognized or observed.

SECTION 5. MAKE-UP DAYS

When severe weather, power failure, fire or natural disaster or other similar circumstances beyond the control of the Contractor prevent work from being performed on a regularly scheduled weekday, the Contractor may schedule a Saturday make-up day (or Friday make-up day in the case of a 4/10 schedule) and such time shall be scheduled and paid as if performed on a weekday. Any other Saturday work shall be paid at time and one-half (1½). The Contractor shall notify the Local Union on the missed day or as soon thereafter as practicable if such a make-up day is to be worked.

SECTION 6. REPORTING PAY

A. Employees who report to the work location pursuant to their regular schedule and who are not provided with work shall be paid two hours reporting pay at straight time rates. An employee whose work is terminated early by a Contractor due to severe weather, power failure, fire or natural disaster of for similar circumstances beyond the Contractor's control, shall receive pay only for such time as is actually worked. In other instances, in which an employee's work is terminated early (unless provided otherwise elsewhere in this Agreement), the employee shall be paid for their full shift. Contractors shall not be permitted to call, text or email or voicemail employees in advance of their regularly scheduled shift starting time to avoid reporting pay. Notwithstanding the above, in the event that the National Weather Service issues a weather advisory for the area in which the work location is situated, and the entire project is shut down as a result of the Weather Advisory, the Contractor shall be permitted to speak to employees no less than four (4) hours in advance of their shift starting time, unless the Local Union consents to a shorter notice in writing, to advise them not to report to work due to the National Weather Service advisory, and employees who are so notified shall not receive two (2) hours reporting pay if they report to the work location. The Contractor shall make every effort to notify each employee directly and confirm that notification has been received. Voice, text, and email messages left for employees without

confirmation of delivery and receipt by employee do not constitute sufficient notice under this provision.

B. When an employee, who has completed their scheduled shift and left the Program Work site, is "called out" to perform special work of a casual, incidental or irregular nature, the employee shall receive overtime pay at the rate of time and one-half of the employee's straight time rate for hours actually worked.

C. When an employee leaves the job or work location of their own volition or is discharged for cause or is not working as a result of the Contractor's invocation of Section 7 below, they shall be paid only for the actual time worked.

D. Except as specifically set forth in this Article there shall be no premiums, bonuses, hazardous duty, high time or other special premium payments or reduction in shift hours of any kind.

E. There shall be no pay for time not actually worked except as specifically set forth in this Article and except where an applicable Schedule "A" requires a full weeks' pay for forepersons.

SECTION 7. PAYMENT OF WAGES

A. Termination - Employees who are laid off or discharged for cause shall be paid in full for that which is due them at the time of termination. The Contractor shall also provide the employee with a written statement setting forth the date of lay off or discharge.

SECTION 8. EMERGENCY WORK SUSPENSION

A Contractor may, if considered necessary for the protection of life and/or safety of employees or others, suspend all or a portion of Program Work. In such instances, employees will be paid for actual time worked, except that when a Contractor requests that employees remain at the job site available for work, employees will be paid for that time at their hourly rate of pay.

SECTION 9. INJURY/DISABILITY

An employee who, after commencing work, suffers a work-related injury or disability while performing work duties, shall receive no less than a full day's pay in accordance with the employee's regularly scheduled workday under Article 12, Section (1)(A). Further, the employee shall be rehired at such time as able to return to duties provided there is still Program Work available for which the employee is qualified and able to perform.

SECTION 10. TIME KEEPING

A Contractor may utilize systems to check employees in and out. Each employee must check in and out and sign a daily sign-in sheet, or other attendance methodology approved in writing by the Agency(s). The Contractor will provide adequate facilities for checking in and out in an expeditious manner.

SECTION 11. MEAL PERIOD

A Contractor shall schedule an unpaid period of not more than 1/2-hour duration at the work location between the 3rd and 5th hour of the scheduled shift. A Contractor may, for efficiency of operation, establish a schedule which coordinates the meal periods of two or more crafts, or which provides for staggered lunch periods within a craft or trade. If an employee is required to work through the meal period, the employee shall be compensated in a manner established in the applicable Schedule "A".

SECTION 12. BREAK PERIODS

There will be no rest periods, organized coffee breaks or other non-working time established during working hours. Individual coffee containers will be permitted at the employee's work location. Where 4/10s are being worked there shall be a morning and an afternoon coffee break.

ARTICLE 13 - APPRENTICES AND WORKFORCE DEVELOPMENT

SECTION 1. APPRENTICE RATIOS AND REFERRALS

A. Recognizing the need to maintain continuing supportive programs designed to develop adequate numbers of competent workers in the construction industry and to provide craft entry opportunities for minorities, women and economically disadvantaged non-minority males, Contractors will employ apprentices in their respective crafts to perform such work as is within their capabilities and which is customarily performed by the craft in which they are indentured. Contractors may utilize apprentices and such other appropriate classifications in the maximum ratio permitted by the New York State Department of Labor ("NYSDOL") or the maximum allowed per trade. Apprentices and such other classifications as are appropriate shall be employed in a manner consistent with the provisions of the appropriate Schedule "A" agreement. The parties encourage, as an appropriate source of apprentice recruitment consistent with the rules and operations of the affiliated unions' apprentice-programs, the use of the Edward J. Malloy Initiative for Construction Skills, Non-Traditional Employment for Women, New York Helmets to Hardhats, and Pathways to Apprenticeship (P2A). Should a Contractor request that apprentices be provided for Program Work, the referring Local Union shall comply with that request so long as it is consistent with the maximum ratios permitted by NYSDOL.

SECTION 2. WORKFORCE DEVELOPMENT

A. The parties to this Agreement recognize the mutual interest in increasing training and career opportunities for Program Hires. The parties are committed to (i) increasing opportunities for Program Hires in these zip codes in pre-apprenticeship and apprenticeship programs, and (ii) using the work opportunities provided by this Agreement to increase the career opportunities for qualified Program Hires, and (iii) to assure the continued availability of a skilled and qualified, readily available construction workforce for this program and future work. The parties agree to the Workforce Development Program set forth in Exhibit "D".

B. Specifically, the parties have established an initiative entitled HireNYC Construction Careers, which is an initiative to advance career opportunities for Program Hires.

C. The HireNYC Construction Careers initiative will work with the Mayor's Office of Workforce Development ("WKDEV") and its Workforce1 Centers to recruit Program Hires interested in employment in the construction industry.

D. HireNYC Construction Careers intends to capitalize on the work opportunities presented by this Agreement to create a pathway to career opportunities in the construction workforce. To this end the HireNYC Construction Careers initiative includes a workforce goal of at least 30% of all hours worked under this Agreement, including by subcontractors pursuant to Article 3, Section 1(B)(12), to be worked by workers residing within the specified zip codes or NYCHA housing. In order to encourage recruitment of new workers, HireNYC Construction Careers has established a goal that at least 30% of all of those hours are to be worked by apprentices from those zip codes or NYCHA housing.

E. The Contractors and Unions agree to cooperate and participate in the implementation of HireNYC Construction Careers to assist Program Hires with educational and training opportunities related to access to pre-apprenticeship, apprenticeship, and project work as set forth in this Agreement.

F. Reporting Requirements:

i. The Contractors shall report the residence zip code information on all certified payroll reports.

ii. The Local Unions, their referral systems, the affiliated pre-apprentice programs, and Contractors shall cooperate with any protocol developed for monitoring the HireNYC Construction Careers initiative.

iii. The Local Unions shall provide the WKDEV copies of the following

reports when such reports are submitted to NYSDOL: *Apprentice Training Recruitment Notification and Minimum Qualifications (AT 505)*, *Apprentice Training Program Affirmative Action Plan (AT 603), Apprenticeship Agreement (AT 401), or such alternate reporting system as the parties may negotiate during the term of this Agreement*.

G. The City and BCTC agree that no less than annually, the LMC shall review the implementation of HireNYC Construction Careers, as well as Program Hire opportunities afforded as a result of the initiative. The City and BCTC will collaborate to develop monitoring protocol for the purpose of measuring the success of HireNYC Construction Careers. The City and BCTC may, on mutual consent, modify the goals, procedures and protocols, as necessary to afford continued opportunity to Program Hires.

H. To facilitate the commitments set forth in this Agreement, each Local Union shall designate a HireNYC Construction Careers lead representative to work in partnership with WKDEV to implement these workforce and apprenticeship provisions within the union and across City construction contracts.

ARTICLE 14 - SAFETY PROTECTION OF PERSON AND PROPERTY

SECTION 1. SAFETY REQUIREMENTS

Each Contractor will ensure that applicable OSHA and safety requirements are at all times maintained on the Program Work site and the employees and Unions agree to cooperate fully with these efforts to the extent consistent with their rights and obligations under the law. Employees will cooperate with employer safety policies and will perform their work at all times in a safe manner and protect themselves and the property of the Contractor and Agency from injury or harm, to the extent consistent with their rights and obligations under the law. Failure to do so will be grounds for discipline, including discharge. The Construction Manager and/or Contractor may

adopt, and the Unions shall agree to, the Drug and Alcohol Testing Policy attached as Schedule "B".

SECTION 2. CONTRACTOR RULES

Employees covered by this Agreement shall at all times be bound by the reasonable safety, security, and visitor rules as established by the Contractors and the Construction Manager for Program Work. Such rules will be published and posted in conspicuous places throughout the Program Work sites. Any site security and access policies established by the Construction Manager or General Contractor intended for specific application to the construction workforce for Program Work and that are not established pursuant to an Agency directive shall be implemented only after notice to the BCTC and its affiliates and an opportunity for negotiation and resolution by the Labor Management Committee.

SECTION 3. INSPECTIONS

The Contractors and Construction Manager retain the right to inspect incoming shipments of equipment, apparatus, machinery and construction materials of every kind.

ARTICLE 15 - TEMPORARY SERVICES

SECTION 1.

Temporary services, i.e. all temporary heat, climate control, water, power and light, shall only be required upon the determination of the Agency or Construction Manager, and when used shall be staffed and assigned to the appropriate trade(s) with jurisdiction. Temporary services shall be provided by the appropriate Contractors' existing employees during working hours in which a shift is scheduled for employees of the Contractor. The Agency or Construction Manager may determine the need for temporary services requirements during non-working hours, and when used shall be staffed and assigned to the appropriate trades(s), and which may be limited to one person per applicable trade where practicable. There shall be no stacking of trades on temporary services,

provided this does not constitute a waiver of primary trade jurisdiction. In the event a temporary system component is claimed by multiple trades, the matter shall be resolved through the New York Plan for Jurisdictional Disputes.

ARTICLE 16 - NO DISCRIMINATION

SECTION 1. COOPERATIVE EFFORTS

The Contractors and Unions agree that they will not discriminate against any employee or applicant for employment because of creed, race, color, religion, sex, sexual orientation, national origin, marital status, citizenship status, disability, gender identity, age or any other status provided by law, in any manner prohibited by law or regulation.

SECTION 2. LANGUAGE OF AGREEMENT

Any words signifying any gender shall be interpreted to mean any or all gender identities.

ARTICLE 17 - GENERAL TERMS

SECTION 1. PROJECT RULES

A. The Construction Manager and the Contractors shall establish such reasonable Program Work rules that are not inconsistent with this Agreement or rules common in the industry and are reasonably related to the nature of work. These rules will be explained at the pre-job conference and posted at the Program Work sites and may be amended thereafter as necessary. Notice of amendments will be provided to the appropriate Local Union. Failure of an employee to observe these rules and regulations shall be grounds for discipline, including discharge. The fact that no order was posted prohibiting a certain type of misconduct shall not be a defense to an employee disciplined or discharged for such misconduct when the action taken is for cause.

B. The parties adopt and incorporate the BCTC's Standards of Excellence as annexed hereto as Exhibit "B".

SECTION 2. TOOLS OF THE TRADE

The welding/cutting torch and chain fall are tools of the trade having jurisdiction over the work performed. Employees using these tools shall perform any of the work of the trade. There shall be no restrictions on the emergency use of any tools or equipment by any qualified employee or on the use of any tools or equipment for the performance of work within the employee's jurisdiction.

SECTION 3. SUPERVISION

Employees shall work under the supervision of the craft foreperson or general foreperson.

SECTION 4. TRAVEL ALLOWANCES

There shall be no payments for travel expenses, travel time, subsistence allowance or other such reimbursements or special pay except as expressly set forth in this Agreement.

SECTION 5. FULL WORKDAY

Employees shall be at their work area at the starting time established by the Contractor, provided they are provided access to the work area. The signatories reaffirm their policy of a fair day's work for a fair day's wage.

SECTION 6. COOPERATION AND WAIVER

The Construction Manager, Contractors and the Unions will cooperate in seeking any NYSDOL, or any other government, approvals that may be needed for implementation of any terms of this Agreement. In addition, the Council, on their own behalf and on behalf of its participating affiliated Local Unions and their individual members, intend the provisions of this Agreement to control to the greatest extent permitted by law, notwithstanding contrary provisions of any applicable prevailing wage, or other, law and intend this Agreement to constitute a waiver of any such prevailing wage, or other, law to the greatest extent permissible only for work within the scope of this Agreement, including specifically, but not limited to those provisions relating to shift, night,

and similar differentials and premiums. This Agreement does not, however, constitute a waiver or modification of the prevailing wage schedules applicable to work not covered by this Agreement.

ARTICLE 18 - SAVINGS AND SEPARABILITY

SECTION 1. THIS AGREEMENT

In the event that the application of any provision of this Agreement is enjoined, on either an interlocutory or permanent basis, or is otherwise determined to be in violation of law, or if such application may cause the loss of project funding or any New York State Labor Law exemption for all or any part of the Program Work, the provision or provisions involved (and/or its application to particular Program Work, as necessary) shall be rendered, temporarily or permanently, null and void, but where practicable the remainder of the Agreement shall remain in full force and effect to the extent allowed by law (and to the extent no funding or exemption is lost), unless the part or parts so found to be in violation of law or to cause such loss are wholly inseparable from the remaining portions of the Agreement and/or are material to the purposes of the Agreement. In the event a court of competent jurisdiction finds any portion of the Agreement to trigger the foregoing, the parties will immediately enter into negotiations concerning the substance affected by such decision for the purpose of achieving conformity with the court determination and the intent of the parties hereto for contracts to be let in the future.

SECTION 2. THE BID SPECIFICATIONS

In the event that the Agency's (or Construction Manager's) bid specifications, or other action, requiring that a successful bidder (and subcontractor) become signatory to this Agreement is enjoined, on either an interlocutory or permanent basis, or is otherwise determined to be in violation of law, or may cause the loss of project funding or any New York State Labor Law exemption for all or any part of the Program Work, such requirement (and/or its application to particular Program Work, as necessary) shall be rendered, temporarily or permanently, null and void, but where practicable the Agreement shall remain in full force and effect to the extent allowed

by law and to the extent no funding or exemption is lost In such event, the Agreement shall remain in effect for contracts already bid and awarded or in construction only where the Agency and Contractor voluntarily accepts the Agreement. The parties will enter into negotiations as to modifications to the Agreement to reflect the court or other action taken and the intent of the parties for contracts to be let in the future.

SECTION 3. NON-LIABILITY

In the event of an occurrence referenced in Section 1 or Section 2 of this Article, neither the Agency, the Construction Manager, any Contractor, nor any Union shall be liable, directly or indirectly, for any action taken, or not taken, to comply with any court order or injunction, other determination, or in order to maintain funding or a New York State Labor Law exemption for Program Work. Bid specifications will be issued in conformance with court orders then in effect and no retroactive payments or other action will be required if the original court determination is ultimately reversed.

SECTION 4. NON-WAIVER

Nothing in this Article shall be construed as waiving the prohibitions of Article 7 as to signatory Contractors and signatory Unions.

ARTICLE 19 - FUTURE CHANGES IN SCHEDULE "A" AREA CONTRACTS

SECTION 1. CHANGES TO AREA CONTRACTS

A. Schedule "A" to this Agreement shall continue in full force and effect until the Contractor and/or Union parties to the Area CBAs that are the basis for the Schedule "A" notify the Mayor's Office of Contract Services ("MOCS"), Agency and Construction Manager in writing by providing a copy of the updated CBA(s) incorporating the changes agreed to in that Area CBA which are applicable to work covered by this Agreement and their effective dates.

B. It is agreed that any provisions negotiated into Schedule "A" CBAs will not apply to work under this Agreement if such provisions are less favorable to those uniformly required of

contractors for construction work normally covered by those agreements; nor shall any provision be recognized or applied on Program Work if it may be construed to apply exclusively, or predominantly, to work covered by this Agreement.

C. Any disagreement between signatories to this Agreement over the incorporation into Schedule "A" of provisions agreed upon in the renegotiation of Area CBAs shall be resolved in accordance with the procedure set forth in Article 9 of this Agreement.

SECTION 2. LABOR DISPUTES DURING AREA CONTRACT NEGOTIATIONS

The Unions agree that there will be no strikes, work stoppages, sympathy actions, picketing, slowdowns or other disruptive activity or other violations of Article 7 affecting the Program Work by any Local Union involved in the renegotiation of Area Local CBAs nor shall there be any lock-out on such Program Work affecting a Local Union during the course of such renegotiations.

ARTICLE 20 - WORKERS' COMPENSATION ADR

SECTION 1.

An Alternative Dispute Resolution ("ADR") program may be negotiated and participation in the ADR program will be optional by trade.

ARTICLE 21 - HELMETS TO HARDHATS

SECTION 1.

The Contractors and the Unions recognize a desire to facilitate the entry into the building and construction trades of veterans who are interested in careers in the building and construction industry. The Contractors and Unions agree to utilize the services of the New York City Helmets to Hardhats Program ("H2H") to serve as a resource for preliminary orientation, assessment of construction aptitude, referral to apprenticeship programs or hiring halls, counseling and mentoring, support network, employment opportunities and other needs as identified by the parties.

SECTION 2.

The Unions and Contractors agree to coordinate with H2H to create and maintain an integrated database of veterans interested in working on this project and of apprenticeship and employment opportunities for this project. To the extent permitted by law, the Unions will give credit to such veterans for bona fide, provable past experience.

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

IN WITNESS WHEREOF the parties have caused this Agreement to be executed and effective as of the ___ day of_____, _____.

FOR BUILDING AND CONSTRUCTION TRADES COUNCIL
OF GREATER NEW YORK AND VICINITY

BY: _____
Gary LaBarbera
President

FOR NEW YORK CITY

BY: _____
Dean Fuleihan
First Deputy Mayor

APPROVED AS TO FORM:

_____
ACTING CORPORATION COUNSEL
NEW YORK CITY

LIST OF SIGNATORY UNIONS
International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers and Helpers, AFL-CIO, Local Lodge No.5
Bricklayers and Allied Craftworkers, Local Union No. 1
Building Concrete & Excavating Laborers, Local Union No. 731
N.Y.C. and Vicinity District Council of Carpenters
Cement Masons, Local Union No. 780
Concrete Workers District Council No. 16
Asbestos, Lead & Hazardous Waste, Laborers Local Union No. 78
Construction & General Building Laborers Local Union No. 79
Derrickmen and Riggers Local Union No. 197
International Brotherhood of Electrical Workers, Local Union No. 3
International Union of Elevator Constructors, Local Union No. 1
Heat & Frost Insulators & Allied Workers, Local Union No. 12
Heat & Frost Insulators & Allied Workers, Local Union No. 12A
Pavers & Road Builders, Laborers Local Union No. 1010
New York State Iron Workers District Council
Structural Iron Workers, Local Union No. 40
Structural Iron Workers, Local Union No. 361
Mason Tenders District Council
Metallic Lathers & Reinforcing Ironworkers, Local No. 46
Ornamental Iron Workers, Local Union No. 580
Glaziers No. 1087, District Council 9
Painters, District Council No. 9
Metal Polishers, Local Union No. 8A-28A; District Council No. 9
Drywall Tapers Local Union No 1974, District Council 9
Bridge & Structural Steel Painters, Local Union No. 806, District Council 9
Operative Plasterers Local Union No. 262
UA Plumbers Local Union No. 1
Private Sanitation, Teamsters Local Union No. 813
Roofers & Waterproofers, Local Union No. 8
Sheet Metal Workers, Local Union No. 28
Sheet Metal Workers, Local Union No. 137
UA Steamfitters, Local Union No. 638
Teamsters, Local Union No. 282
Tile, Marble & Terrazzo, B.A.C. Local Union No. 7

SCHEDULE "A" - CBAs

Union	Current Agreement w/
Architectural and Ornamental Iron Workers Local Union 580, AFL-CIO	Allied Building Metal Industries, Inc.
Building, Concrete, Excavating & Common Laborers Local 731	Independent
Building, Concrete, Excavating & Common Laborers Local 731	Members of the General Contractors Association of New York, Inc.
Bricklayers Local 1 of the International Union of Bricklayers and Allied Craftworkers	Independent
District Council No. 9, I.U.P.A.T Glaziers Local 1087	Window and Plate Glass Dealers Association
Drywall Tapers and Painters Local 1974, affiliated with International Union of Painters & Allied Trades and Drywall Taping Contractor's Association & Association of Wall-Ceiling & Carpentry Industries NY, Inc.	Independent
Enterprise Association of Steamfitters and Apprentices Local 638	Mechanical Contractors Association of NY, Inc.
Enterprise Association of Steamfitters and Apprentices Local 638	Independent
Elevator Constructors Local 1 of NY and NJ	ThyssenKrupp Elevator Corporation
Elevator Constructors Local 1 of NY and NJ	Independent
Highway Road and Street Laborers Local Union 1010 of the District Council of Pavers and Road Builders of the Laborers' International Union of North America AFL-CIO	Independent
Highway Road and Street Laborers Local Union 1010 of the District Council of Pavers and Road Builders of the Laborers' International Union of North America AFL-CIO	Member of the General Contractors Association of New York, Inc.
International Association of Heat and Frost Insulators and Allied Workers Local No. 12 of New York City	Independent
International Association of Heat and Frost Insulators and Allied Workers Local No. 12 of New York City	The Insulation Contractors Association of New York City, Inc.
International Association of Heat and Frost Insulators and Allied Workers Local No. 12A of New York City	Independent

International Association of Heat and Frost Insulators and Allied Workers Local No. 12A of New York City	Environmental Contractors Association, Inc.
International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers and Helpers, AFL-CIO, Local Lodge No. 5	Boilermakers Association of Greater New York
Local Union No. 3 International Brotherhood of Electrical Workers, AFL-CIO	New York Electrical Contractors Association
International Brotherhood of Teamsters, Local 282, High Rise Contract	Building Contractors Association & Independents
Local 46 Metallic Lathers Union and Reinforcing Iron Workers of NY and Vicinity of the International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers	Cement League
Local 46 Metallic Lathers Union and Reinforcing Iron Workers of NY and Vicinity of the International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers	Independent
Local 8 Roofers, Waterproofers & Allied Workers	Roofing and Waterproofing Contractors Association of New York and Vicinity
Local Union 1 of the United Association of Journeymen and Apprentices of the Pipe Fitting Industry of the United States and Canada	Association of Contracting Plumbers of the City of New York
Local Union Number 40 & 361 of Bridge, Structural Ornamental and Reinforcing Iron Workers AFL-CIO	Independent
Mason Tenders DC & Laborers' International Union – Local 78 & 79	Building Contractors Association
Mason Tenders DC & Laborers' International Union – Local 78 & 79	Interior Demolition Contractors Association
Mason Tenders DC & Laborers' International Union – Local 78 & 79	Independent
Mason Tenders DC & Laborers' International Union – Local 78 & 79	NYCDCA
Mason Tenders DC & Laborers' International Union – Local 78 & 79	Environmental Contractors Association
Mason Tenders DC & Laborers' International Union – Local 78 & 79	ABMC

Operative Plasterers' and Cement Masons' International Association Local No. 262	Independent
Painters and Allied Trades AFL-CIO, District Council No. 9 (Painting and Protective Coatings CBA)	Independent
Painters and Allied Trades AFL-CIO, District Council No. 9 (Painting and Protective Coatings CBA)	The Association of Master Painters & Decorators of NY, Inc. and The Association of Wall, Ceiling & Carpentry Industries of NY, Inc. and The Window and Plate Glass Dealers Association
Sheet Metal Workers' International Association, Local 28	Sheet Metal & Air Conditioning Contractors Association of New York City, Inc.
Sheet Metal Workers' International Association, Local 137	The Greater New York Sign Association
Structural Steel and Bridge Painters Local 806, DC 9 International Union of Painters and Allied Trades, AFL-CIO	New York Structural Steel Painting Contractors Association
Teamsters Local 813	Independent
Teamsters Local 813	IESI NY Corporation
The Cement Masons' Union, Local 780	Cement League
The District Council of Cement and Concrete Workers (comprised of Local 6A; Local 18A and Local 20)	Cement League
The District Council of Cement and Concrete Workers (comprised of Local 6A; Local 18A and Local 20)	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Heavy Carpenters	GCA
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Dockbuilders Local No. 1556	Concrete Contractors of NY
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Dockbuilders Local 1556	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Millwright Local 740	Independent

The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Timbermen Local 1556	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Timbermen Local 1556	GCA
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Heavy Carpenters	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Carpenters	Manufacturing Woodworkers Association of Greater New York Incorporated
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America	The Hoisting Trade Association of New York, Inc.
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America	The Test Boring Association
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America	Building Contractors Association
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America	The Association of Wall-Ceiling & Carpentry Industries of New York, Incorporated
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners	The Cement League
The District Council of NYC and Vicinity of the United Brotherhood of Carpenters and Joiners of America	New York City Millwright Association
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners	Greater New York Floor Covering Association
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Carpenters	Association of Architectural Metal & Glass

The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Carpenters	Concrete Contractors of NY
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Building Construction Carpenters	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Local 2287	Independent
The District Council of New York City and Vicinity of the United Brotherhood of Carpenters and Joiners of America for Shop Carpenters	Independent
The Tile Setters and Tile Finishers Union of New York and New Jersey, Local 7 of the International Bricklayers and Allied Craftworkers	The Greater New York and New Jersey Contractors Association
United Derrickmen & Riggers Association, Local 197 of NY, LI, Westchester & Vicinity	Contracting Stonesetters Association Inc.
United Derrickmen & Riggers Association Local 197 of NY, LI, Westchester and Vicinity	Building Stone and Pre-cast Contractors Association

Exhibit A

Project Labor Agreement - Letter of Assent

Dear: _____

The undersigned party confirms that it agrees to be a party to and be bound by the New York Agency, Project Labor Agreement as such Agreement may, from time to time, be amended by the parties or interpreted pursuant to its terms. The terms of the Project Labor Agreement, its Schedules, Addenda and Exhibits are hereby incorporated by reference herein.

The undersigned, as a Contractor or Subcontractor (hereinafter Contractor) on the Project known as the NYC Agency Renovation and located at _____ (hereinafter PROJECT), for and in consideration of the award to it of a contract to perform work on said PROJECT, and in further consideration of the mutual promises made in the Project Labor Agreement, a copy of which was received and is acknowledged, hereby:

(1) Accepts and agrees to be bound by the terms and conditions of the Agreement, together with any and all schedules; amendments and supplements now existing or which are later made thereto:

(2) Agrees to be bound by the legally established collective bargaining agreements; local trust agreements for employee benefit funds; and trust documents for joint apprentice programs as well as apprentice program rules and procedures but only to the extent of Program Work and as required by the PLA.

(3) Authorizes the parties to such local trust agreements to appoint trustees and successor trustees to administer the trust funds and hereby ratifies and accepts the trustees so appointed as if made by the Contractor but only to the extent of Program Work as required by the PLA.

(4) Certifies that it has no commitments or agreements that would preclude its full and complete compliance with the terms and conditions of said Agreement. The Contractor agrees to employ labor that can work in harmony with all other labor on the Project and shall require labor harmony from every lower tier subcontractor it has engaged or may engage to work on the Project. Labor harmony disputes/issues shall be subject to the Labor Management Committee provisions.

(5) Agrees to secure from any Contractor(s) (as defined in said Agreement) which is or becomes a Subcontractor (of any tier), to it, a duly executed Agreement to be Bound in from identical to this document.

Provide description of the Work, identify craft jurisdiction(s) and all contract numbers below:

Local Union: _____

Description of Work: _____

_____

Contract Number(s): _____

Dated: _____

_____
(Name of Contractor or subcontractor)

_____
(Name of CM; GC; Contractor or Higher Level Subcontractor)

_____
(Authorized Officer & Title)

_____
(Address)

_____
(Signature)

_____
(Phone) (Fax)

Contractor's State License
#_____

Sworn to before me this
____ day of _____,

_____
Notary Public

Exhibit B

NEW YORK CITY BUILDING AND CONSTRUCTION TRADES COUNCIL STANDARDS OF EXCELLENCE

The purpose of this Standard of Excellence is to reinforce the pride of every construction worker and the commitment to be the most skilled, most productive and safest workforce available to construction employers and users in the City of New York. It is the commitment of every affiliated local union to use our training and skills to produce the highest quality work and to exercise safe and productive work practices.

The rank and file members represented by the affiliated local unions acknowledge and adopt the following standards:

- ***Provide a full day's work for a full days pay;***
- ***Safely work towards the timely completion of the job;***
- ***Arrive to work on time and work until the contractual quitting time;***
- ***Adhere to contractual lunch and break times;***
- ***Promote a drug and alcohol free work site;***
- ***Work in accordance with all applicable safety rules and procedures;***
- ***Allow union representatives to handle job site disputes and grievances without resort to slowdowns, or unlawful job disruptions;***
- ***Respect management directives that are safe, reasonable and legitimate;***
- ***Respect the rights of co-workers;***
- ***Respect the property rights of the owner, management and contractors.***

The Unions affiliated with the New York City Building and Construction Trades Council will expect the signatory contractors to safely and efficiently manage their jobs and the unions see this as a corresponding obligation of the contractors under this Standard of Excellence. The affiliated unions will expect the following from its signatory contractors:

- ***Management adherence to the collective bargaining agreements;***
- ***Communication and cooperation with the trade foremen and stewards;***
- ***Efficient, safe and sanitary management of the job site;***
- ***Efficient job scheduling to mitigate and minimize unproductive time;***
- ***Efficient and adequate staffing by properly trained employees by trade;***
- ***Efficient delivery schedules and availability of equipment and tools to ensure efficient job progress;***
- ***Ensure proper blueprints, specifications and layout instructions and material are available in a timely manner***
- ***Promote job site dispute resolution and leadership skills to mitigate such disputes;***
- ***Treatment of all employees in a respectful and dignified manner acknowledging their contributions to a successful project.***

The affiliated unions and their signatory contractors shall ensure that both the rank and file members and the management staff shall be properly trained in the obligations undertaken in the Standard of Excellence.

Exhibit "C" - HireNYC Construction Careers

(August 2020 version)

Non-exhaustive list of zip codes where at least 15% of the individuals are below the federal poverty rate
(Zip codes within ~100 mile radius of NYC)

Zip Code	Borough	Neighborhood
10001	Manhattan	Midtown South
10002	Manhattan	Chinatown
10009	Manhattan	East Village
10025	Manhattan	Manhattan Valley
10026	Manhattan	Central Harlem
10027	Manhattan	Manhattanville
10029	Manhattan	East Harlem
10030	Manhattan	Central Harlem
10031	Manhattan	Hamilton Heights
10032	Manhattan	Inwood and Washington Heights
10033	Manhattan	Washington Heights
10034	Manhattan	Inwood
10035	Manhattan	East Harlem
10037	Manhattan	Central Harlem
10038	Manhattan	Lower Manhattan
10039	Manhattan	Central Harlem
10040	Manhattan	Inwood and Washington Heights
10301	Staten Island	St. George
10302	Staten Island	Port Richmond
10303	Staten Island	Mariner's Harbor
10304	Staten Island	Stapleton
10310	Staten Island	West Brighton
10451	Bronx	Concourse Village
10452	Bronx	High Bridge
10453	Bronx	University Heights
10454	Bronx	Mott Haven
10455	Bronx	Longwood
10456	Bronx	Melrose
10457	Bronx	Central Bronx
10458	Bronx	Bedford Park
10459	Bronx	Morrisania
10460	Bronx	East Tremont
10462	Bronx	Parkchester
10463	Bronx	Kingsbridge
10466	Bronx	Wakefield
10467	Bronx	Norwood
10468	Bronx	Bronx Park and Fordham
10472	Bronx	Unionport
10473	Bronx	Soundview
10474	Bronx	Hunts Point

PLA Exhibit C - HireNYC Construction Careers

(August 2020 version)

Non-exhaustive list of zip codes where at least 15% of the individuals are below the federal poverty rate

(Zip codes within ~100 mile radius of NYC)

Zip Code	Borough	Neighborhood
11101	Queens	Long Island City
11102	Queens	Northwest Queens
11106	Queens	Ravenswood
11203	Brooklyn	East Flatbush
11204	Brooklyn	Borough Park
11205	Brooklyn	Fort Greene
11206	Brooklyn	East Williamsburg
11207	Brooklyn	East New York
11208	Brooklyn	East New York / Cypress Hills
11211	Brooklyn	Williamsburg
11212	Brooklyn	Brownsville
11213	Brooklyn	Crown Heights
11214	Brooklyn	Bensonhurst
11216	Brooklyn	Central Brooklyn
11218	Brooklyn	Kensington
11219	Brooklyn	Borough Park
11220	Brooklyn	Sunset Park
11221	Brooklyn	Bushwick
11223	Brooklyn	Gravesend
11224	Brooklyn	Coney Island
11225	Brooklyn	Prospect Lefferts Gardens
11226	Brooklyn	Prospect Park South
11230	Brooklyn	Midwood
11232	Brooklyn	Sunset Park
11233	Brooklyn	Ocean Hill
11235	Brooklyn	Brighton Beach
11237	Brooklyn	Bushwick and Williamsburg
11239	Brooklyn	Starrett City
11354	Queens	Downtown Flushing
11355	Queens	Queensboro Hill
11368	Queens	South Corona
11369	Queens	East Elmhurst
11373	Queens	Elmhurst
11416	Queens	Southwest Queens
11417	Queens	Ozone Park
11418	Queens	Richmond Hill
11430	Queens	Ozone Park
11432	Queens	Jamaica Center
11433	Queens	South Jamaica
11435	Queens	Briarwood
11691	Queens	Far Rockaway
11692	Queens	Arverne

Data Source: 2013-2017 American Community Survey 5-year estimates

PLA Exhibit C - HireNYC Construction Careers

(August 2020 version)

Non-exhaustive list of zip codes where at least 15% of the individuals are below the federal poverty rate

(Zip codes within ~100 mile radius of NYC)

Zip Code	State	City or Town
06401	CT	Ansonia
06510	CT	New Haven
06511	CT	New Haven
06513	CT	New Haven
06515	CT	New Haven
06519	CT	New Haven
06604	CT	Bridgeport
06605	CT	Bridgeport
06607	CT	Bridgeport
06608	CT	Bridgeport
06610	CT	Bridgeport
06702	CT	Waterbury
06704	CT	Waterbury
06705	CT	Waterbury
06706	CT	Waterbury
06708	CT	Waterbury
06710	CT	Waterbury
06810	CT	Danbury
07002	NJ	Bayonne
07017	NJ	East Orange
07018	NJ	East Orange
07022	NJ	Fairview
07026	NJ	Garfield
07029	NJ	Harrison
07047	NJ	North Bergen
07050	NJ	Orange
07055	NJ	Passaic
07060	NJ	Plainfield
07062	NJ	Plainfield
07087	NJ	Union City
07093	NJ	West New York
07102	NJ	Newark
07103	NJ	Newark
07104	NJ	Newark
07105	NJ	Newark
07106	NJ	Newark
07107	NJ	Newark
07108	NJ	Newark
07111	NJ	Irvington
07112	NJ	Newark
07114	NJ	Newark
07201	NJ	Elizabeth
07202	NJ	Elizabeth
07206	NJ	Elizabethport
07208	NJ	Elizabeth
07304	NJ	Jersey City
07305	NJ	Jersey City
07306	NJ	Jersey City
07307	NJ	Jersey City
07310	NJ	Jersey City

PLA Exhibit C - HireNYC Construction Careers

(August 2020 version)

Non-exhaustive list of zip codes where at least 15% of the individuals are below the federal poverty rate

(Zip codes within ~100 mile radius of NYC)

Zip Code	State	City or Town
07501	NJ	Paterson
07502	NJ	Paterson
07503	NJ	Paterson
07504	NJ	Paterson
07505	NJ	Paterson
07513	NJ	Paterson
07514	NJ	Paterson
07522	NJ	Paterson
07524	NJ	Paterson
07608	NJ	Teterboro
07703	NJ	Fort Monmouth
07712	NJ	Asbury Park
07727	NJ	Farmingdale
07734	NJ	Keansburg
07740	NJ	Long Branch
07820	NJ	Allamuchy
07939	NJ	Lyons
08031	NJ	Bellmawr
08045	NJ	Lawnside
08095	NJ	Winslow
08102	NJ	Camden
08103	NJ	Camden
08104	NJ	Camden
08105	NJ	Camden
08110	NJ	Pennsauken
08217	NJ	Elwood
08224	NJ	New Gretna
08608	NJ	Trenton
08609	NJ	Trenton
08611	NJ	Trenton
08618	NJ	Trenton
08638	NJ	Trenton
08701	NJ	Lakewood
08751	NJ	Seaside Heights
08808	NJ	Broadway
08861	NJ	Perth Amboy
08901	NJ	New Brunswick
10545	NY	Maryknoll
10550	NY	Mount Vernon
10601	NY	White Plains
10701	NY	Yonkers
10703	NY	Yonkers
10705	NY	Yonkers
10801	NY	New Rochelle
10927	NY	Haverstraw
10932	NY	Howells
10940	NY	Middletown
10950	NY	Monroe
10952	NY	Monsey
10963	NY	Otisville
10977	NY	Spring Valley

PLA Exhibit C - HireNYC Construction Careers

(August 2020 version)

Non-exhaustive list of zip codes where at least 15% of the individuals are below the federal poverty rate

(Zip codes within ~100 mile radius of NYC)

Zip Code	State	City or Town
11096	NY	Inwood
11550	NY	Hempstead
11556	NY	Uniondale
11713	NY	Bellport
11798	NY	Wyandanch
11951	NY	Mastic Beach
11970	NY	South Jamesport
12401	NY	Kingston
12416	NY	Chichester
12419	NY	Cottekill
12427	NY	Elka Park
12428	NY	Ellenville
12432	NY	Glasco
12457	NY	Mount Tremper
12475	NY	Ruby
12489	NY	Wawarsing
12490	NY	West Camp
12491	NY	West Hurley
12516	NY	Copake
12550	NY	Newburgh
12561	NY	New Paltz
12583	NY	Tivoli
12589	NY	Wallkill
12594	NY	Wingdale
12601	NY	Poughkeepsie
12701	NY	Monticello
12725	NY	Claryville
12729	NY	Cuddebackville
12732	NY	Eldred
12733	NY	Fallsburg
12743	NY	Highland Lake
12747	NY	Hurleyville
12749	NY	Kauneonga Lake
12751	NY	Kiamesha Lake
12754	NY	Liberty
12758	NY	Livingston Manor
12759	NY	Loch Sheldrake
12762	NY	Mongaup Valley
12763	NY	Mountain Dale
12779	NY	South Fallsburg
12780	NY	Sparrow Bush
19007	PA	Bristol
19123	PA	Philadelphia
19125	PA	Philadelphia
19134	PA	Philadelphia
19135	PA	Philadelphia
19136	PA	Philadelphia
19137	PA	Philadelphia

Data Source: 2013-2017 American Community Survey 5-year estimates

EXHIBIT "D"
MEMORANDUM OF UNDERSTANDING

MEMORANDUM OF UNDERSTANDING, entered into as of _____, between the City of New York ("City") with an office located at City Hall, New York, NY 10007, the Building and Construction Trades Council of Greater New York and Vicinity ("BCTC"), on its behalf and on behalf of its affiliated unions, with its principal place of business located at 350 West 31st Street, New York, NY 10001, and the Building Trade Employers' Association of New York City ("BTEA"), on its behalf and on behalf of its affiliated contractors, with its principal place of business located at 1325 Avenue of the Americas, New York, NY 10019.

WHEREAS, since 2009, the City, the BCTC, and the BTEA have entered into Memoranda of Understanding (each an "MOU"), contemporaneous to the City entering to Project Labor Agreements with the BCTC (each a "PLA"), setting goals on new apprenticeship opportunities for graduates of direct entry pre-apprenticeship programs for low-income New Yorkers, minorities, high school students, women, veterans, NYCHA residents, and qualified employees of Minority- and Women-Owned Business Enterprises ("M/WBEs") that become signatory to the union, and have provided increased opportunities for New Yorkers to have access to good union construction careers;

WHEREAS, in 2014, the City and the BCTC entered into an MOU related to the New York City Build It Back Program and committed to encourage contractors and subcontractors to employ Sandy-impacted residents and for the City and the BCTC to work together with community-based organizations to recruit and train New York City residents, with an emphasis on Sandy-impacted low income residents;

WHEREAS, the BCTC and the BTEA committed to: (i) promote the representation of veterans, women, high school graduates of the City's public schools, and New Yorkers in need of economic opportunity in apprenticeship programs jointly sponsored by BCTC unions and BTEA contractors, and (ii) improve workforce training and development for entrance into the construction industry;

WHEREAS, in 2014, the City of New York issued *Career Pathways: One City Working Together,* with a commitment to maximize local job opportunities through the City's contracts, and as such the City is committed to ensuring that low-income New Yorkers have access to the good jobs and careers that are created through the City's capital investments and through this MOU and contemporaneous PLA, the City the BCTC, and with the cooperation of the BTEA contractors can connect low-income New Yorkers to good prevailing wage construction careers;

WHEREAS, through this MOU and contemporaneous PLAs, the City, the BCTC, and the BTEA commit to recruiting in low-income communities, providing opportunities through pre-apprenticeship and apprenticeship programs for access to construction careers, and ensuring residents of low-income communities, including apprentices, are provided opportunities to work on publicly-funded and -assisted construction projects;

WHEREAS, pursuant to Local Law 1 of 2013, the City is also committed to its M/WBE program, and in partnership with the M/WBE Leadership Association seeks to encourage eligible companies to certify as M/WBEs, and provides a wide range of training and technical assistance to build the capacity of its certified companies to bid successfully for the City's contracts and subcontracts;

WHEREAS, an important element in the success of pre-apprenticeship and apprenticeship programs, as well as in creating work opportunities for contractors and sub-contractors in New York City, is the availability of work on publicly funded and assisted projects; and

WHEREAS, the parties to this MOU desire to publicly state their intentions with respect to apprenticeship programs and the creation of contracting and other economic opportunities in the construction industry.

NOW, THEREFORE, the City, the BCTC, and the BTEA state as follows:

1. Scope. This MOU:

a. States the intentions of the City, the BCTC, and the BTEA regarding:

a. the provision of opportunities in apprenticeship programs jointly sponsored by BCTC unions and BTEA contractors;
b. the City's application of apprenticeship requirements in City construction contracts from the time of execution through December 31, 2024;
c. the joint goal of the City, the BCTC, and the BTEA to create employment opportunities, including apprenticeships, in the construction industry; and

b. Shall terminate on December 31, 2024

2. To facilitate the commitments set forth in this MOU, each Local Union shall designate a HireNYC Construction Careers lead representative to work in partnership with the Mayor's Office of Workforce Development ("WKDEV") to implement these workforce and apprenticeship provisions within the union and across City construction contracts.

3. The BCTC and the BTEA shall work collaboratively with the City to reserve at least 500 new apprenticeship positions each calendar year through both the general recruitment and direct entry programs for New York City residents living in zip codes where at least 15% of the individuals in such zip code are below the federal poverty rate and NYCHA residents regardless of zip code.

4. The BCTC and BTEA shall work collaboratively with the City to reserve new apprenticeship positions each year for direct entry.

a. New York State Department of Labor ("NYSDOL") approved Direct Entry programs may be used by sponsors of Registered Apprenticeship programs as another way to bring apprentices into their programs. It is a tool to help sponsors reach underrepresented populations. Direct Entry provides individuals who successfully complete an apprenticeship preparation program, and who meet the minimum requirements for a NYS Registered Apprenticeship program, with the direct opportunity for an interview with the

sponsor of a program bypassing the general recruitment scheduled for the Apprentice Programs.

5. Apprenticeship programs jointly sponsored by Local Unions and employers affiliated with the BTEA shall, subject to approval by the NYSDOL and to the extent consistent with applicable consent decrees, court orders or similar mandates, reserve up to the following percentages of their new apprenticeships (some apprentices may be counted in more than one category) for direct entry each year:

a. 20% for graduates of New York City public high school who have completed pre-apprenticeship training provided by The Edward J. Malloy Initiative for Construction Skills ("C-SKILLS");

b. 10% for veterans of the U.S. Armed Forces who are referred by New York City Helmets to Hardhats ("NYC H2H"), provided, however, that any veterans whose qualifications allow them to enter unions as journeypersons shall be counted toward the fulfillment of this percentage;

c. 15% for women who have completed pre-apprenticeship training provided by Nontraditional Employment for Women ("NEW");

d. 10% for NYCHA and Section 8 residents who have completed pre-apprenticeship training provided by C-SKILLS, NEW, the NYCHA Resident Training Academy ("NRTA"), or Pathways to Apprenticeships ("P2A");

e. 10% for justice-involved individuals who have completed pre-apprenticeship training provided by C-SKILLS, NEW, NRTA, or P2A; and

f. 5% for qualified employees of certified minority- and women-owned business enterprises and other employers not signatory to collective bargaining agreements of unions affiliated with the BCTC which become signatory to such collective bargaining agreements, provided, however, that any such employees whose qualifications allow them to enter unions as journeypersons shall be counted toward the fulfillment of this percentage.

6. To help reach the goals set forth in paragraph 3, 4, and 5, the City, the BCTC and the BTEA will work cooperatively to identify and pursue appropriate sources of public and private funds and resources, as needed, to provide pre-apprenticeship training scaled to support the goals targeting at least seven hundred (700) pre-apprenticeship positions cumulatively for all above named direct entry programs each year. The City will help coordinate recruitment within the zip codes and target populations identified in paragraphs 3, 4 and 5.

7. The goals in Paragraphs 3, 4, and 5 are aggregate goals for apprenticeship programs jointly sponsored by the Local Unions and BTEA contractors to achieve on an annual basis through their general recruitments and direct entry programs. The City recognizes that different apprenticeship programs face different circumstances and

have varying capacities to meet the percentages set forth in each category; notwithstanding that, the BCTC and the BTEA agree to encourage and support meeting the goals in Paragraphs 3, 4, and 5, and to work with apprenticeship programs jointly sponsored by their affiliated unions and contractors to take affirmative steps to achieve that goal.

8. The City, BCTC, and BTEA acknowledge that on federally funded projects NYCHA, and the City on certain federally funded projects, must comply with Executive Order 11246 and federal regulations contained at 24 CFR Part 135 ("Section 3") regarding efforts to employ residents of NYCHA developments and other Section 3 populations.

9. The City, the BCTC, and the BTEA will jointly seek any necessary waivers from NYSDOL with respect to direct entry goals for the joint apprentice programs, as well as jointly support and encourage 100% participation of all affiliated joint apprentice programs.

10. Reporting.

    a. Each Local Union shall provide, or cause to be provided by their Apprentice Directors, copies of the following reports to WKDEV within thirty (30) days of the submission to NYSDOL:

        i. *Apprentice Training Recruitment Notification and Minimum Qualifications (AT 505)* submissions to NYSDOL;
        ii. *Apprentice Training Program Affirmative Action Plan (AT 603)* submissions to NYSDOL; and
        iii. *Apprenticeship Agreement (AT 401)* submissions to NYSDOL.

    b. Pre-apprenticeship programs funded in part by the City will provide quarterly reports, beginning at the end of the first quarter after the first class is held, to the WKDEV with detailed information as required by NYC's Workforce Common Metrics reporting for all individuals trained in all classes.

    c. On an annual basis, beginning on January 1, 2021, the City shall provide an electronic report to the BCTC that contains a list of contracts registered in the previous full fiscal year that were subject to either a City Project Labor Agreement or the Apprenticeship Directive. Such list shall contain the following for each contract:

        i. contracting agency
        ii. contract name;
        iii. prime contractor name;
        iv. registered dollar amount; and
        v. date of registration.

d. Upon mutual agreement, the parties may modify these reporting requirements, as needed.

11. City of New York Apprenticeship Directive. As a means of expanding the pool of work available to apprentices and graduates of state-approved apprenticeship programs providing opportunities to the groups of individuals designated in Paragraphs 3 and 5 above, the City states its intention to implement, as may be amended from time to time, the Directive, attached as Exhibit A. The Directive directs City agencies, for construction contracts where either (i) the cost estimate of the contract exceeds $3 million, or (ii) the cost estimate of the contract exceeds $2 million on a project with a cost estimate of at least $5 million, and for such other contracts as the bidding agency determines to be appropriate, to require the contractor and any of its subcontractors with subcontracts worth at least $2 million to have apprenticeship agreements appropriate for the type and scope of work to be performed that have been registered with, and approved by, the New York State Commissioner of Labor, and shall have passed any required probationary period and recertification established by the New York State DOL.

12. The City shall include a statement concerning the applicability of the Directive in every City Record notice of the solicitation or award of a contract for a public works project. Within five (5) days of the issuance of any waiver from the apprenticeship requirement, the City shall notify the BCTC and the BTEA, in writing or electronically, of the granting of such waiver and the reasons therefore.

13. The City, the BCTC, and the BTEA look forward to working together and with the contractor community in a spirit of cooperation and good will toward the goal that all New Yorkers from diverse backgrounds, particularly minorities, women, returning veterans, recent public high school graduates, NYCHA residents, individuals in need of economic opportunity, and justice-involved individuals, are well-prepared for participation in the workforce and can gain access to good careers in the construction industry, in both the private and public sectors.

For the City of New York

By: _____

First Deputy Mayor, Dean Fuleihan

For Building and Construction Trades Council of Greater New York and Vicinity

By: _____

Gary LaBarbera, President

For Building Trades Employers' Association of New York City

By: _____

Louis J. Coletti, President & CEO

SCHEDULE "B" - DRUG AND ALCOHOL POLICY

PREAMBLE

WHEREAS, [CONSTRUCTION MANAGER] ("Construction Manager"), for the construction project located at [PROJECT ADDRESS] ("Project") desires to provide for a safe, drug and alcohol-free work site for the Project;

WHEREAS, the parties have entered into a separate Project Labor Agreement for the Project and have agreed to negotiate in good faith a Project Drug & Alcohol Testing Policy;

WHEREAS, this Testing Policy is collectively negotiated between the Construction Manager and the New York City Building and Construction Trades Council ("Council") (the Construction Manager and BCTC are collectively referred to hereafter as the "Parties");

WHEREAS, the Parties each currently have respective drug and alcohol policies, including the Projects' Zero-Tolerance policy;

WHEREAS, the Parties desire to maximize project safety conditions for the Project personnel and public, as well as deter violations of the Parties' respective drug and alcohol policies;

NOW, THEREFORE, the Parties agree to this Policy as of the date hereof,

ARTICLE 1 - PARTIES

This Drug & Alcohol Testing Policy ("Policy") is hereby established by the Construction Manager and the Council, on behalf of itself and its affiliated local union members, and the signatory local unions on behalf of themselves and their members.

ARTICLE 2-GENERAL CONDITIONS

SECTION 2.1 - SUMMARY

In order to reinforce the Parties' respective drug and alcohol policies, including the Projects' zero tolerance policy regarding the prohibition of the use of drugs and alcohol, and to deter Project personnel from violating those policies, the Parties agree that all Project Personnel (defined later) will be required to submit to drug and/or alcohol testing randomly, post-accident, and for reasonable suspicion.

Any individual on site that violates this Policy is subject to disciplinary action, including, without limitation, loss of site access privileges.

SECTION 2.2 - REVOCATION OF PROJECT ACCESS PRIVILEGES

Any one of the following occurrences will result in the immediate revocation of a Project Personnel's project access privileges:

1. An individual is found selling or using drugs or alcohol, or otherwise is under the influence of drugs or alcohol, subject to the other terms of this Policy, on a Project Site;
2. An individual has been convicted under any criminal drug or alcohol

statute for a violation occurring in the workplace within the past two years;

3. An individual who refuses to abide by the Projects' drug and alcohol policy, or refuses to submit to a test in accordance with this Policy;

4. An individual who switches, adulterates, or in any way tampers with a specimen required to be submitted in accordance with this Policy.

SECTION 2.3 - DEFINITIONS

Confirmed Positive Test: The presence of drugs, drug metabolites, or alcohol in a person's body that equals or exceeds the established cut off levels as defined in Exhibit 1. For drugs, the sample will have undergone Laboratory screening and confirmation testing and must have been verified as positive by a Medical Review Officer. A positive test result for alcohol obtained through Evidential Breath Testing is considered a Confirmed Positive Test.

Employee Assistance Program (EAP): An EAP is generally considered a workplace-based, confidential program designed to help employees deal effectively with a variety of personal problems, and, of relevance to this policy, substance abuse problems. The EAP promotes assessments and short-term counseling. An EAP shall also include any similar education or rehabilitation program provided by the Councilor its respective members. The Project Personnel that are required to participate in the EAP shall be responsible for the cost of their consultation with an EAP and/or participation in any education or rehabilitation program.

Evidential Breath Testing Device (EBT): A device that is used to measure alcohol in the breath and which meets National Highway Traffic Safety Administration's specifications for precision and accuracy.

Laboratory: A laboratory that is SAMHSA (Substance Abuse and Mental Health Services Administration) certified for the testing of drugs.

Medical Review Officer (MRO): A licensed physician responsible for receiving laboratory results generated by an employer's drug testing plan who has knowledge of substance abuse disorders and medical training to interpret and evaluate a donor's confirmed positive test result together with his/her medical history and all other relevant information.

Previous Worker: All individuals whose employment relationship with the contractor, company or organization no longer exists.

Project Site: The construction area for respective Project.

Reasonable Suspicion: When a qualified trade contractor, the Developer or Construction Manager as set forth in Section 3.7, reasonably believes that an individual has violated this Policy. Reasonable suspicion is based upon (1) specific, current, behavioral or performance indicators, (2) the possible manufacture, distribution, consumption or possession of unauthorized drugs, drug paraphernalia, or alcohol, or (3) documented investigation by an agency retained by, or otherwise independent from, the Developer or Construction Manager.

SECTION 2.4 - INCLUDED SUBJECTS

This Policy shall cover all employees of the Owner, Construction Manager and Project

trade contractors, their subcontractors and any other of their respective personnel at any level that are performing any activity at a Project Site, inclusive of managers, superintendents and supervisors, except as specifically excluded by Section 2.5 of this Policy (collectively and singularly, "Project Personnel").

SECTION 2.5 - EXCLUDED SUBJECTS

The following persons are not subject to the provisions of this Policy:

A. Employees and entities engaged in off-site manufacture, modifications, repair, maintenance, assembly, painting, handling or fabrication of components, materials, equipment or machinery;

B. Vendors and employees of vendors engaged on a Project Site in equipment testing, inspection, training, warranty work, or engaged in corrections of defective or nonconforming work, unless such employees are expressly included in the bargaining unit of a local signatory to this Agreement;

C. Employees engaged in ancillary work on a Project which is performed by third parties, such as electric utilities, gas utilities, telephone companies, and railroads, or any other work not constituting Project work;

D. Employees of any governmental authority (state, local or otherwise);

E. Employees and contractors engaged in work on the Project Site as part of due diligence or monitoring, which work is ancillary to Project work; and

F. Emergency responders.

SECTION 2.6 - PRESCRIPTION AND NON-PRESCRIPTION DRUGS

The use of prescription drugs not prescribed directly to Project Personnel is prohibited, including the use of drugs prescribed to a spouse or domestic partner. The use of non-prescription drugs that are sold outside the United States and that contain substances that are illegal or require a prescription in the United States are prohibited, unless prescribed by a licensed physician.

SECTION 2.7 - SEARCHES

In order for the Construction Manager to ensure the safety of Project Personnel and for the Construction Manager to protect its assets, the Construction Manager shall have the right upon good cause (such as reasonable suspicion of a violation of this Policy) to conduct reasonable searches for alcohol, drugs and related paraphernalia anywhere within the boundaries of a Project Site. A search may include any assets owned or leased by any Project Personnel that is on a Project Site, including without limitation, vehicles, lockers, gang boxes, desks and personal property brought onto a Project Site, but excluding personal body searches or physical contact with employees.

ARTICLE 3 - DRUG & ALCOHOL TESTING

SECTION 3.1 - COLLECTION PROCESS

As of the execution date of this PLA, Project Personnel may be required to submit urine samples ("Preliminary Drug Screening") for the purpose of detecting the presence of drugs as part of the random, post-accident or reasonable suspicion testing, in accordance with

chain of custody protocols as established by Substance Abuse and Mental Health Services Administration (SAMHSA), utilizing an instant result test cup for Preliminary Drug Screenings, such testing is to be performed on-site by an independent service provider. The results from the instant result test cup will be considered preliminary. The sample will be sent to a SAMHSA certified testing laboratory for confirmation.

As of the date hereof, all Project Personnel will be required to submit to an Evidential Breath Test (EBT) for the purpose of detecting the presence of alcohol when submitting to random, post-accident or reasonable suspicion testing. Alcohol testing will not be conducted for pre-access testing.

SECTION 3.2 - NEGATIVE PRELIMINARY DRUG SCREENING

Project Personnel with a negative Preliminary Drug Screening will be considered conditionally accepted for Project site access, pending confirming laboratory results. Site access privileges will be revoked if the subsequent laboratory results determine that the sample has tested positive for drugs or that the sample has been adulterated.

SECTION 3.3 POSITIVE PRELIMINARY DRUG SCREENING

If the Preliminary Drug Screening indicates a positive result, the individual will not be allowed access to the Project Site. The sample will be sent to the certified laboratory for analysis and, if applicable, reviewed by the Medical Review Officer (MRO). If the laboratory confirmation results are also positive, the individual will be considered in violation of this Policy and their site access will be revoked for at least 30 days. If the laboratory confirmation results are negative, the Project Personnel's site access will not be revoked.

SECTION 3.4 CONFIRMED POSITIVE TEST RESULTS

A. POSITIVE DRUG TEST

A drug test is considered positive if the test results exceed the limits shown in Exhibit 1, which is attached hereto and incorporated herein by reference. The test will be confirmed through a second analysis process and reviewed by an MRO before results are reported. Project Personnel with confirmed positive drug test results will have their site access revoked. In case of a "false positive" result, any such Personnel shall be entitled to the reimbursement of any wages lost during the suspension caused by any such false positive result.

B. POSITIVE EBT

An EBT is considered positive if the test results exceed .04 BrAC, or as otherwise set forth in Exhibit 1. Project Personnel with a positive alcohol test result will be subject to the remedies set forth in Exhibit 1.

C. REINSTATEMENT OF SITE ACCESS PRIVILEGES

(a) Subject to section 3.4(C)(a) immediately below, if the site access of a Project Personnel has been revoked pursuant to this Policy, then any such person may request that their site access be reinstated after 30 days, provided that all of the following conditions are met to the reasonable satisfaction of the Construction Manager. :

1. The individual has provided proof of wellness from an accredited rehabilitation

facility or has provided proof that treatment isn't needed as attested to by a licensed health care provider specializing in the diagnosis and treatment of alcohol and drug abuse.

2. A current drug and alcohol test is obtained within three (3) days of the request for re-access to the site and proof of a negative test result has been received; and
3. The individual agrees to submit to multiple testing for two (2) full years from the date of gaining re-access to the project, the scheduling of which will be determined at the sole discretion of the Construction Manager. If all of these conditions have been met, the Construction Manager agrees that it will not unreasonably withhold their consent to any such request.

(b) Unlawful possession, concealment, use, purchase, sale, manufacture, dispensation or distribution of illegal drugs or un-prescribed controlled substances on the Project site will subject the Project Personnel Employee to immediate removal from the Project site and shall bar such Project Personnel Employee from returning for a minimum of three (3) months, which return shall, in any event, be subject to the reasonable approval by Construction Manager.

(c) All of the Parties agree that any such Project Personnel will only be entitled to any such reinstatement of site access privileges one time and that any subsequent violation of this Policy will result in the permanent termination of access to the Project Site.

SECTION 3.5 - RANDOM TESTING

A third-party provider designated by the Construction Manager will randomly select by an objective criteria a testing pool for random drug and/or alcohol testing from all Project Personnel with site access cards. Any individual selected for a random drug and/or alcohol test will be required to submit to an Evidential Breath Test (EBT) and/or drug test. Individuals may be tested more than once during any given time period. The Parties acknowledge and agree that an EBT may be required without a drug test and that a drug test may be required without an EBT, as solely determined by the Construction Manager.

If an individual is unable to attend the first scheduled random drug test as a result of being involved in a work-related task, such drug test will be rescheduled and will be completed at or before the conclusion of such employee's then current work shift. If the second drug test is missed for any reason, the incident will be reviewed by the Construction Manager, who shall have the right to terminate the site access privileges of any such Project Personnel until such time as that Project Personnel has complied with this Policy. If the individual refuses to take the test, their access privileges will be immediately terminated for cause.

SECTION 3.6 - POST ACCIDENT TESTING

After each work-related incident or injury requiring the services of a licensed health care provider, all Project Personnel involved with the incident will be required to submit to a drug and/or alcohol test immediately following the incident. In instances where emergency care is necessary, the drug and/or alcohol test shall be obtained by the care facility, if possible, within 24 hours after treatment is rendered. If more than 48 hours have passed before an injury is reported and treated by a licensed health care provider, an alcohol test will not be required.

In addition, any Project Personnel involved in a non-injury related incident at a Project Site

with damages at or in excess of $200 will be required to submit to a drug and/or alcohol test unless:

A. It is determined, after conducting an investigation and interviewing all employees involved and any witnesses, that the employee's performance can be completely discounted as a contributing factor to the incident; or
B. It is determined, after conducting an incident investigation and interviewing all employees and any witnesses that the incident was caused by inadequate equipment or system design, and/or premature failure of equipment or system components.

SECTION 3.7 - REASONABLE SUSPICION TESTING

All Project Personnel will be required to submit to a drug and/or alcohol test when there is reasonable suspicion the individual has violated this policy.

Reasonable suspicion includes, without limitation, the following:

A. Violent or irrational behavior;
B. Emotional or physical unsteadiness;
C. Sensory or motor-skill malfunctions;
D. Slurred speech;
E. The odor of alcohol or drugs on clothing or breath in conjunction with other indicators;
F. Possession of alcohol, unauthorized drugs or drug paraphernalia; or
G. Documented evidence of an independent investigation regarding Project Personnel's consumption of what is reasonably believed to be an alcoholic beverage or drugs in violation of the Project's policies and/or this Policy.

Reasonable suspicion testing may only be ordered by supervisory personnel that: (a) have been trained to recognize the above referenced factors; or (b) have received credible documentary evidence from an independent investigator that a Project Personnel has violated a drug and/or alcohol policy. It is agreed that any certified training program shall satisfy the training requirement.

SECTION 3.8 - PRIVACY CONSIDERATIONS

The Parties agree to use reasonable efforts to conduct any testing pursuant to this Policy in accordance with the privacy concerns of Project Personnel. To address these concerns, the Parties agree that:

1. The testing station(s) shall be screened off, or otherwise closed off from public view.
2. All documents and information regarding the testing, including test results, shall be maintained by the respective custodian(s) of record in accordance with their respective privacy policies, which any Project Personnel shall be entitled to review upon timely request.

3. The Parties agree to make a good faith effort to resolve any other privacy concern of Project Personnel regarding this Policy, provided that any such concerns do not interfere with the purpose of this Policy.

ARTICLE 4 – GRIEVANCE

SECTION 4.1 - REPRESENTED WORKERS

Nothing in this Policy shall restrict a member of a signatory local union from filing a grievance in accordance with the member's collective bargaining agreement or a Project Labor Agreement, provided that the grievance shall be limited to whether the removal of a member for violation of this Policy was conducted in compliance with the terms and conditions set forth herein.

SECTION 4.2 - HOLD HARMLESS

The Construction Manager agrees to hold harmless and indemnify the Union/Council and its representatives from any liability that may be incurred as a result of the Company's Drug and Alcohol Policy to the extent caused by the negligence or intentional misconduct of the Construction Manager.

IN WITNESS WHEREOF the parties have agreed to this Policy as of _____, 20___.

FOR [CONSTRUCTION MANAGER]

By: _____

Name: [INSERT NAME]_____

Title: [INSERT TITLE]_____

FOR GREATER NEW YORK CITY BUILDING TRADES COUNCIL

By: _____

Name: Gary LaBarbera _____

Title: President

EXHIBIT 1

CLASS OF DRUGS TESTED AND THEIR RESPECTIVE CUT-OFF LIMITS

The cut-off limits established are those recommended by the U.S. Department of Health and Human Services in their mandatory Guidelines for Federal Workplace Drug Testing Programs.

Drug Class	Screening Cut-Off Limit (ng/ml)	Confirmation Cut-off Limit (ng/ml)
Amphetamines	1000	500
Benzoylecgonine (Cocaine Metabolite)	300	150
Cannabinoids (THC)	50	15
*Opiates	2000	10
Phencyclidine (PCP)	25	25

Confirmation screening is done by means of GC/MS analysis.

*The GC/MS confirmation for opiates will be for both codeine and morphine separately. If morphine is equal to or greater than 2,000ng/ml then the GC/MS confirmation analysis for 6- acetylmorphine (6-MAM) is at a cut-off level of 10ng/ml.

Alcohol Screening

All Project Personnel will be required to submit to an EBT under the random, post-accident, and reasonable suspicion test arenas, for the purpose of detecting presence of alcohol. If this test supports a positive result for presence of alcohol, the Project Personnel will be considered in violation of this Policy.

If the results of the EBT are:

1. Above 0.001 BrAC, but at or below 0.020 BrAC, a second test will be conducted within approximately 15 minutes.
    - If the second BrAC test is less than the first BrAC, the results will be deemed negative and the Project Personnel may return to work, if there are no other outstanding issues.
- If the second BrAC is increasing, but below 0.04 BrAC, the results will be deemed negative, but the Project Personnel will be sent home for the day and the Construction Manager shall be notified. If a Project Personnel is sent home two times within a six-month period pursuant to this Section I, then any such Project Personnel shall be deemed to have tested positive and will be subject to the applicable remedies set forth in Section 2 below.

2. Above 0.02 BrAC, but below 0.06 BrAC, a second test will be conducted after approximately 15 minutes.

- Notwithstanding anything set forth above to the contrary, a Project Personnel may elect to voluntarily go home for the day instead of taking a second test and the results will be deemed negative, provided that any such Project Personnel may not voluntarily go home more than once within a twelve month period.
- If the second BrAC test is at or below 0.02 BrAC, the results will be deemed negative and the Project Personnel may return to work if there are no other outstanding issues.
- If the second BrAC test is above 0.020, but below 0.06, the results will be deemed positive, the Project Personnel will be sent home for the day and their site access will be revoked for at least five [5] calendar days and until such time as the Project Personnel has been evaluated by an EAP professional skilled in substance abuse and confirmed fit for duty.
- Any Project Personnel who is deemed positive two times within two years pursuant to this Section 2 will have their site access privileges terminated and will be entitled to the limited relief set forth in Section 3 .4(c) of the Policy.

3. At or above .06 BrAC, the Project Personnel will have their site access privileges terminated, after which they will be entitled to the limited relief set forth in Section 3.4(C) of the Policy.

CITY OF NEW YORK

DEPARTMENT OF DESIGN AND CONSTRUCTION

INFORMATION FOR BIDDERS

December 2021

THIS PAGE INTENTIONALLY LEFT BLANK

CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION

INFORMATION FOR BIDDERS

TABLE OF CONTENTS

1.	Description and Location of Work	1
2.	Time and Place for Receipt of Bids	1
3.	Definitions	1
4.	Invitation For Bids and Contract Documents	1
5.	Pre-Bid Conference	1
6.	Agency Contact	1
7.	Bidder's Oath	1
8.	Examination and Viewing of Site, Consideration of Other Sources of Information and Changed Conditions	2
9.	Examination of Proposed Contract	2
10.	Form of Bid	2
11.	Irrevocability of Bid	3
12.	Acknowledgment of Amendments	3
13.	Bid Samples and Descriptive Literature	3
14.	Proprietary Information/Trade Secrets	3
15.	Pre-Opening Modification or Withdrawal of Bids	3
16.	Bid Evaluation and Award	3
17.	Late Bids, Late Withdrawals and Late Modifications	3
18.	Withdrawal of Bids.	3
19.	Mistake in Bids	4
20.	Low Tie Bids	4
21.	Rejection of Bids	5
22.	Right to Appeal Determinations of Non-Responsiveness or Non-Responsibility and Right to Protest Solicitations and Award	5
23.	Affirmative Action and Equal Employment Opportunity	5
25.	Complaints About the Bid Process	6
26.	Bid, Performance and Payment Security	6
27.	Failure to Execute Contract	7
28.	Bidder Responsibilities and Qualifications	7
29.	Employment Report	7
30.	Labor Law Requirements	8
31.	Insurance	8
32.	Lump Sum Contracts	8
33.	Unit Price Contracts	8

34. Excise Tax 9
35. Licenses and Permits 9
36. Multiple Prime Contractors 9
37. Locally Based Enterprise Requirements (LBE) 9
38. Bid Submission Requirements 11
39. Comptroller's Certificate 11
40. Procurement Policy Board Rules 11
41. DDC Safety Requirements 11

1. Description and Location of Work

The description and location of the work for which bids are requested are specified in the PASSPort RFx field "Description".

2. Time and Place for Receipt of Bids

Sealed bids shall be received on or before the date and hour specified in the PASSPort RFx, at which time they will be publicly opened and read aloud in the presence of the Commissioner or the Commissioner's or her representative, and any bidders who may desire to be present.

3. Definitions

The definitions set forth in the Procurement Policy Board Rules shall apply to this Invitation For Bids.

4. Invitation For Bids and Contract Documents

(A) Except for titles, sub-titles, headings, running headlines, tables of contents and indices (all of which are printed herein merely for convenience) the following, except for such portions thereof as may be specifically excluded, shall be deemed to be part of the Contract and the Invitation for Bids.

(1) All provisions required by law to be inserted in this Contract, whether actually inserted or not

(2) The Contract Drawings and Specifications

(3) The General Conditions, the General Requirements and the Special Conditions, if any

(4) The Contract

(5) The Information for Bidders; Request for Proposals; Notice of Solicitation and Proposal For Bids; Bid or Proposal, and the Bid Booklet

(6) The Budget Director's Certificate; all Addenda issued prior to the receipt of the bids; the Notice of Award; Performance and Payment Bonds, if required; and the Notice to Proceed with the Work.

(B) For particulars as to this procurement, including quantity and quality of the purchase, extent of the work or labor to be performed, delivery and performance schedule, and any other special instructions, prospective bidders are referred to the Invitation For Bids Documents. A copy of such documents can be obtained in the PASSPort RFx.

5. Pre-Bid Conference

A pre-bid conference shall be held as set forth in the PASSPort RFx. Nothing stated at the pre-bid conference shall change the terms or conditions of the Invitation For Bids Documents, unless a change is made by written amendment as provided in Section 9 below. Failure to attend a mandatory pre-bid conference shall constitute grounds for the rejection of the bid.

6. Agency Contact

Any questions or correspondence relating to this bid solicitation shall be addressed to the Agency Contact person specified in the PASSPort RFx.

7. Bidder's Oath

(A) The bid shall be properly signed by an authorized representative of the bidder and the bid shall be verified by the written oath of the authorized representative who signed the bid, that the several matters stated and information furnished therein are in all aspects true.

(B) A materially false statement willfully or fraudulently made in connection with the bid or any of the forms completed and submitted with the bid may result in the termination of any Contract between the City and the Bidder. As a result, the Bidder may be barred from participating in future City contracts as well as be subject to possible criminal prosecution.

8. Examination and Viewing of Site, Consideration of Other Sources of Information and Changed Conditions

(A) Pre-Bidding (Investigation) Viewing of Site - Bidders must carefully view and examine the site of the proposed work, as well as its adjacent area, and seek other usual sources of information, for they will be conclusively presumed to have full knowledge of any and all conditions on, about or above the site relating to or affecting in any way the performance of the work to be done under the Contract which were or should have been indicated to a reasonably prudent bidder. To arrange a date for visiting the work site, bidders are to contact the Agency Contact person specified in The PASSPort RFx.

(B) Should the contractor encounter during the progress of the work subsurface conditions at the site materially differing from any shown on the Contract Drawings or indicated in the Specifications or such subsurface conditions as could not reasonably have been anticipated by the contractor and were not anticipated by the City, which conditions will materially affect the cost of the work to be done under the Contract, the attention of the Commissioner must be called immediately to such conditions before they are disturbed. The Commissioner shall thereupon promptly investigate the conditions. If the Commissioner finds that they do so materially differ, or that they could not reasonably have been anticipated by the contractor and were not anticipated by the City, the Contract may be modified with the Commissioner's written approval.

9. Examination of Proposed Contract

(A) Request for Interpretation or Correction: Prospective bidders must examine the Contract Documents carefully and before bidding must request the Commissioner in writing for an interpretation or correction of every patent ambiguity, inconsistency or error therein which should have been discovered by a reasonably prudent bidder. Such interpretation or correction, as well as any additional contract provisions the Commissioner may decide to include, will be issued in writing by the Commissioner as an addendum to the Contract, which will be transmitted to each person recorded as having received a copy of the Contract Documents from the Department. Transmission of such addendum will be by mail, e-mail, facsimile or hand delivery. Such addendum will also be posted at the place where the Contract Documents are available for the inspection of prospective bidders. Upon transmission as provided for herein, such addendum shall become a part of the Contract Documents, and binding on all bidders, whether or not actual notice of such addendum is shown.

(B) Only Commissioner's Interpretation or Correction Binding: Only the written interpretation or correction so given by the Commissioner shall be binding, and prospective bidders are warned that no other officer, agent or employee of the City is authorized to give information concerning, or to explain or interpret, the Contract.

(C) Documents given to a subcontractor for the purpose of soliciting the subcontractor's bid shall include either a copy of the bid cover sheet or a separate information sheet setting forth the project name, the Contract number (if available), the contracting agency and the Project's location.

10. Form of Bid

Each bid must be submitted upon the prescribed form and must contain: a) the name, residence and place of business of the person or persons making the same; b) the names of all persons interested therein, and if no other person is so interested, such fact must be distinctly stated; c) a statement to the effect that it is made without any connection with any other person making a bid for the same purpose and that it is in all respects fair and without collusion or fraud; d) a statement that no Council member or other officer or employee or person whose salary is payable in whole or part from the City Treasury is directly or indirectly interested therein or in the supplies, materials or equipment and work or labor to which it relates, or in any portion of the profits thereof; e) a statement that the bidder is not in arrears to the City or to any agency upon a debt or contract or taxes, and is not a defaulter as surety or otherwise upon any obligation to the City to any agency thereof, except as set forth in the bid.

THE BID SHALL BE TYPEWRITTEN OR WRITTEN LEGIBLY IN INK. THE BID SHALL BE SIGNED IN INK. ERASURES OR ALTERATIONS SHALL BE INITIALED BY THE SIGNER IN INK. FAILURE TO CONFORM TO THE REQUIREMENTS OF THIS SECTION 10 SHALL RESULT IN THE REJECTION OF THE BID.

11. Irrevocability of Bid

The prices set forth in the bid cannot be revoked and shall be effective until the award of the Contract, unless the bid is withdrawn as provided for in Sections 15 and 18 below.

12. Acknowledgment of Amendments

The receipt of any amendment to the Contract Documents shall be acknowledged by the bidder in its bid submission.

13. Bid Samples and Descriptive Literature

Bid samples and descriptive literature shall not be submitted by the bidder, unless expressly requested elsewhere in the Contract or Contract Documents. Any unsolicited bid samples or descriptive literature which are submitted shall not be examined or tested and shall not be deemed to vary any of the provisions of this Contract.

14. Proprietary Information/Trade Secrets

(A) The bidder shall identify those portions of the bid which it deems to be confidential, proprietary information or trade secrets, and provide justification why such materials shall not be disclosed by the City. All such materials shall be clearly indicated by stamping the pages on which such information appears, at the top and bottom thereof with the word "Confidential". Such materials stamped "Confidential" must be easily separable from the non-confidential sections of the bid.

(B) All such materials so indicated shall be reviewed by the Agency and any decision not to honor a request for confidentiality shall be communicated in writing to the bidder. For those bids which are unsuccessful, all such confidential materials shall be returned to the bidder. Prices, makes and model or catalog numbers of the items offered, deliveries, and terms of payment shall be publicly available after bid opening, regardless of any designation of confidentiality made by the bidder.

15. Pre-Opening Modification or Withdrawal of Bids

Bids may be modified or withdrawn by written notice received in the office designated in the PASSPort RFx, before the time and date set for the bid opening. If a bid is withdrawn in accordance with this Section, the bid security, if any, shall be returned to the bidder.

16. Bid Evaluation and Award

In accordance with the New York City Charter, the Procurement Policy Board Rules and the terms and conditions of this Invitation For Bids, this Contract shall be awarded, if at all, to the responsible bidder whose bid meets the requirements and evaluation criteria set forth in the Invitation For Bids, and whose bid price is either the most favorable bid price or, if the Invitation For Bids so states, the most favorable evaluated bid price. A bid may not be evaluated for any requirement or criterion that is not disclosed in the Invitation For Bids.

Restriction: No negotiations with any bidder shall be allowed to take place except under the circumstances and in the manner set forth in Section 21. Nothing in this Section shall be deemed to permit a contract award to a bidder submitting a higher quality item than that designated in the Invitation For Bids, if that bid is not also the most favorable bid.

17. Late Bids, Late Withdrawals and Late Modifications

Any bid received at the place designated in the solicitation after the time and date set for receipt of bids is late and shall not be considered. Any request for withdrawal or modification received at the place designated in the solicitation after the time and date set for receipt of bids is late and shall not be considered. The exception to this provision is that a late modification of a successful bid that makes the bid terms more favorable to the City shall be considered at any time it is received.

18. Withdrawal of Bids.

Except as provided for in Section 15, above, a bidder may not withdraw its bid before the expiration of forty-five (45) days after the date of the opening of bids; thereafter, a bidder may withdraw its bid only in writing and in advance of an actual award. If within sixty (60) days after the execution of the Contract, the Commissioner fails to fix the date

for commencement of work by written notice to the bidder, the bidder at the bidder's option, may ask to be relieved of the bidder's obligation to perform the work called for by written notice to the Commissioner. If such notice is given to the Commissioner, and the request to withdraw is granted, the bidder waives all claims in connection with this Contract.

19. Mistake in Bids

(A) Mistake Discovered Before Bid Opening: A bidder may correct mistakes discovered before the time and date set for bid opening by withdrawing or correcting the bid as provided in Section 15 above.

(B) Mistakes Discovered Before Award

(1) In accordance with General Municipal Law (Section 103, subdivision 11), where a unilateral error or mistake is discovered in a bid, such bid may be withdrawn upon written approval of the Agency Chief Contracting Officer if the following conditions are met:

(a) The mistake is known or made known to the agency prior to the awarding of the Contract or within 3 days after the opening of the bid, whichever period is shorter; and

(b) The price bid was based upon an error of such magnitude that enforcement would be unconscionable; and

(c) The bid was submitted in good faith and the bidder submits credible evidence that the mistake was a clerical error as opposed to a judgment error; and

(d) The error in the bid is actually due to an unintentional and substantial arithmetic error or an unintentional omission of a substantial quantity of work, labor, material or services made directly in the compilation of the bid, which unintentional arithmetic error or unintentional omission can be clearly shown by objective evidence drawn from inspection of the original work paper, documents, or materials used in the preparation of the bid sought to be withdrawn; and

(e) It is possible to place the agency in the same position as existed prior to the bid.

(2) Unless otherwise required by law, the sole remedy for a bid mistake in accordance with this Article shall be withdrawal of the bid, and the return of the bid bond or other security, if any, to the bidder. Thereafter, the agency may, in its discretion, award the Contract to the next lowest bidder or rebid the Contract. Any amendment to or reformation of a bid or a Contract to rectify such an error or mistake therein is strictly prohibited.

(3) If the mistake and the intended correct bid are clearly evident on the face of the bid document, the bid shall be corrected to the intended correct bid and may not be withdrawn. Examples of mistakes that may be corrected are typographical errors, errors in extending unit prices, transposition errors and arithmetical errors.

20. Low Tie Bids

(A) When two or more low responsive bids from responsible bidders are identical in price, meeting all the requirements and criteria set forth in the Invitation For Bids, the Agency Chief Contracting Officer will break the tie in the following manner and order of priority:

(1) Award to a certified New York City small, minority or woman-owned business entity bidder;

(2) Award to a New York City bidder;

(3) Award to a certified New York State small, minority or woman-owned business bidder;

(4) Award to a New York State bidder.

(B) If two or more bidders still remain equally eligible after application of paragraph (A) above, award shall be made by a drawing by lot limited to those bidders. The bidders involved shall be invited to attend the drawing. A witness shall be present to verify the drawing and shall certify the results on the bid tabulation sheet.

21. Rejection of Bids

(A) Rejection of Individual Bids: The Agency may reject a bid if:

(1) The bidder fails to furnish any of the information required pursuant to Section 24 or 28 hereof; or if

(2) The bidder is determined to be not responsible pursuant to the Procurement Policy Board Rules; or if

(3) The bid is determined to be non-responsive pursuant to the Procurement Policy Board Rules; or if

(4) The bid, in the opinion of the Agency Chief Contracting Officer, contains unbalanced bid prices and is thus non-responsive, unless the bidder can show that the prices are not unbalanced for the probable required quantity of items, or if the imbalance is corrected pursuant to Section 15.

(B) Rejection of All Bids: The Agency, upon written approval by the Agency Chief Contracting Officer, may reject all bids and may elect to resolicit bids if in its sole opinion it shall deem it in the best interest of the City so to do.

(C) Rejection of All Bids and Negotiation With All Responsible Bidders: The Agency Head may determine that it is appropriate to cancel the Invitation For Bids after bid opening and before award and to complete the acquisition by negotiation. This determination shall be based on one of the following reasons:

(1) All otherwise acceptable bids received are at unreasonable prices, or only one bid is received and the Agency Chief Contracting Officer cannot determine the reasonableness of the bid price, or no responsive bid has been received from a responsible bidder; or

(2) In the judgment of the Agency Chief Contracting Officer, the bids were not independently arrived at in open competition, were collusive, or were submitted in bad faith.

(B) When the Agency has determined that the Invitation for Bids is to be canceled and that use of negotiation is appropriate to complete the acquisition, the contracting officer may negotiate and award the Contract without issuing a new solicitation, subject to the following conditions:

(1) prior notice of the intention to negotiate and a reasonable opportunity to negotiate have been given by the contracting officer to each responsible bidder that submitted a bid in response to the Invitation for Bids;

(2) the negotiated price is the lowest negotiated price offered by a responsible bidder; and

(3) the negotiated price is lower than the lowest rejected bid price of a responsible bidder that submitted a bid in response to the Invitation for Bids.

22. Right to Appeal Determinations of Non-Responsiveness or Non-Responsibility and Right to Protest Solicitations and Award

The bidder has the right to appeal a determination of non-responsiveness or non-responsibility and has the right to protest a solicitation and award. For further information concerning these rights, the bidder is directed to the Procurement Policy Board Rules.

23. Affirmative Action and Equal Employment Opportunity

This Invitation For Bids is subject to applicable provisions of Federal, State and Local Laws and executive orders requiring affirmative action and equal employment opportunity.

24. PASSPort COMPLIANCE

All vendors that intend to do business with the City of New York must complete a disclosure process in order to be considered for a contract. This disclosure process was formerly completed using Vendor Information Exchange System (VENDEX) paper-based forms. The City of New York has moved collection of vendor disclosure information online. In early August 2017, the New York City Mayor's Office of Contract Services (MOCS) launched the Procurement and Sourcing Solutions Portal (PASSPort), a new online procurement system that replaced the paper-VENDEX process. In anticipation of awards, all bidders must create online accounts in the new PASSPort system, and

file all disclosure information using PASSPort. Paper submissions, including certifications of no changes to existing VENDEX packages, will not be accepted in lieu of complete online filings using PASSPort.

All vendors that intend to do business with the City, but specifically those that fall into any of the following categories, are required to enroll:

- Have a pending award with a City Agency; or
- Hold a current contract with a City Agency and have either an expiring VENDEX or expiring Certificate of No Change.

The Department of Design and Construction (DDC) and MOCS hereby notifies all proposers that the PASSPort system is available, and that disclosure filing completion is required prior to any award through this competitive bid.

To enroll in PASSPort and to access the PASSPort website (including online training), please visit www.nyc.gov/passport. Contact MOCS at passport@mocs.nyc.gov for additional information and technical support.

25. Complaints About the Bid Process

The New York City Comptroller is charged with the audit of contracts in New York City. Any vendor who believes that there has been unfairness, favoritism or impropriety in the bid process should inform the Comptroller, Office of Contract Administration, One Centre Street, Room 835, New York, New York; telephone number (212)669-2323.

26. Bid, Performance and Payment Security

(A) Bid Security: Each bid must be accompanied by bid security in an amount and type specified in the PASSPort RFx questionnaire. The bid security shall assure the City of New York of the adherence of the bidder to its proposal, the execution of the Contract, and the furnishing of Performance and Payment Bonds by the bidder, if required in the PASSPort RFx. Bid security shall be returned to the bidder as follows:

(1) Within ten (10) days after the bid opening, the Comptroller will be notified to return the deposits of all but the three (3) lowest bidders. Within five (5) days after the award, the Comptroller will be notified to return the deposits of the remaining two unsuccessful bidders.

(2) Within five (5) days after the execution of the Contract and acceptance of the Contractor's bonds, the Comptroller will be notified to return the bid security of the successful bidder or, if performance and payment bonds are not required, only after the sum retained under Article 21 of the Contract equals the amount of the bid security.

(3) Where all bids are rejected, the Comptroller will be notified to return the deposit of the three (3) lowest bidders at the time of rejection.

(B) Performance and Payment Security: Performance and Payment Security must be provided in an amount and type specified in the PASSPort RFx. The performance and payment security shall be delivered by the contractor prior to or at the time of execution of the Contract. If a contractor fails to deliver the required performance and payment security, its bid security shall be enforced, and an award of Contract may be made to the next lowest responsible and responsive bidder, or the contract may be rebid.

(C) Acceptable Types of Security: Acceptable types of security for bids, performance, and payment shall be limited to the following:

(1) a one-time bond in a form satisfactory to the City;

(2) a bank certified check or money order;

(3) obligations of the City of New York; or

(4) other financial instruments as determined by the Office of Construction in consultation with the Comptroller.

Whenever the successful bidder deposits obligations of the City of New York as performance and payment security, the Comptroller may sell and use the proceeds thereof for any purpose for which the principal or

surety on such bond would be liable under the terms of the Contract. If the money is deposited with the Comptroller, the successful bidder shall not be entitled to receive interest on such money from the City.

(D) Form of Bonds: Security provided in the form of bonds must be prepared on the form of bonds authorized by the City of New York. Forms for bid, performance, and payment bonds are included in the Invitation for Bids Documents. Such bonds must have as surety thereunder such surety company or companies as are: (1) approved by the City of New York; (2) authorized to do business in the State of New York, and (3) approved by the Department of the Treasury of the United States. Premiums for any required bonds must be included in the base bid.

The bidder is advised that submission of a bid bond where the surety on such bond fails to meet the criteria set forth herein, shall result in the rejection of the bid as non-responsive.

The Department of the Treasury of the United States advises that information concerning approved surety companies may be obtained as follows: (1) from the Government Printing Office at 215-364-6465; (2) through the Internet at https://www.fiscal.treasury.gov/surety-bonds/.

(E) Power of Attorney: Attorneys in fact who sign bid, performance, or payment bonds must file with each bond a certified copy of their power of attorney to sign said bonds.

27. Failure to Execute Contract

In the event of failure of the successful bidder to execute the Contract and furnish the required security within ten (10) days after notice of the award of the Contract, the deposit of the successful bidder or so much thereof as shall be applicable to the amount of the award made shall be retained by the City, and the successful bidder shall be liable for and hereby agrees to pay on demand the difference between the price bid and the price for which such Contract shall be subsequently awarded, including the cost of any required reletting and less the amount of such deposit. No plea of mistake in such accepted bid shall be available to the bidder for the recovery of the deposit or as a defense to any action based upon such accepted bid. Further, should the bidder's failure to comply with this Section cause any funding agency, body or group (Federal, State, City, Public, Private, etc.) to terminate, cancel or reduce the funding on this project, the bidder in such event shall be liable also to the City for the amount of actual funding withdrawn by such agency on this project, less the amount of the forfeited deposit.

28. Bidder Responsibilities and Qualifications

(A) Bidders must include with their bids all information necessary for a determination of bidder responsibility, as set forth in the Specifications.

(B) The Agency may require any bidder or prospective bidder to furnish all books of account, records, vouchers, statements or other information concerning the bidder's financial status for examination as may be required by the Agency to ascertain the bidder's responsibility and capability to perform the Contract. If required, a bidder must also submit a sworn statement setting forth such information as the Agency may require concerning present and proposed plant and equipment, the personnel and qualifications of the bidder’s working organizations, prior experience and performance record.

(C) Oral Examination on Qualifications: In addition thereto, and when directed by the Agency, the bidder, or a responsible officer, agent or employee of the bidder, must submit to an oral examination to be conducted by the Agency in relation to the bidder’s proposed tentative plan and schedule of operations, and such other matters as the Agency may deem necessary in order to determine the bidder's ability and responsibility to perform the work in accordance with the Contract. Each person so examined must sign and verify a stenographic transcript of such examination noting thereon such corrections as such person may desire to make.

(D) If the bidder fails or refuses to supply any of the documents or information set forth in paragraph (B) hereof or fails to comply with any of the requirements thereof, the Agency may reject the bid.

29. Employment Report

In accordance with Executive Order No. 50 (1980) as modified by Executive Order 108 (1986), the filing of a

completed Employment Report (ER) is a requirement of doing business with the City of New York for construction contractors with contracts of $1,000,000 or more and subcontractors with construction subcontracts of $750,000 or more. The required forms and information are included in the PASSPort Vendor Profile.

30. Labor Law Requirements

(A) General: The successful bidder will be required to comply strictly with all Federal, State and local labor laws and regulations.

(B) New York State Labor Law: This Contract is subject to New York State Labor Law Section 220, which requires that construction workers on the site be paid prevailing wages and supplements. The Contractor is reminded that all wage provisions of this Contract will be enforced strictly and failure to comply will be considered when evaluating performance. Noncompliance may result in the contractor being debarred by the City from future contracts. Complaints filed with the Comptroller may result in decisions which may debar a contractor from bidding contracts with any state governmental entity and other political subdivisions.

(C) Records: The Contractor is expected to submit accurate payroll reports and other required documents and verify attendance and job classifications being utilized in compliance with the law, Contract provisions and agency procedures.

31. Insurance

(A) Bidders are advised that the insurance requirements contained herein are regarded as material terms of the Contract. As required by Article 22 of the Contract, the contractor must effect and maintain with companies licensed and authorized to do business in the State of New York, the types of insurance set forth therein, when required by and in the amounts set forth in Schedule A of the General Conditions. Such required insurance must be provided from the date the contractor is ordered to commence work and up to the date of final acceptance of all required work.

(B) The contractor must, within ten days of receipt of the notice of award, submit the following insurance documentation: (a) original certificate of insurance for general liability in the amount required by Schedule A of the General Conditions, and (b) original certificates of insurance or other proof of coverage for workers' compensation and disability benefits, as required by Section 57 of the New York State Workers' Compensation Law and Section 220 of the Disability Benefits Law.

32. Lump Sum Contracts

(A) Comparison of Bids: Bids on Lump Sum Contracts will be compared on the basis of the lump sum price bid, adjusted for alternate prices bid, if any.

(B) Lump Sum Bids for "General Construction Work" which include excavation shall include all necessary excavation work defined in the Specifications as being included in the lump sum bid. The bidder shall also bid a unit price for the additional cost of excavating material which is defined in the Specifications as excavation for which additional payment will be made. The total estimated additional cost of removing such material will be taken as the quantity set forth in the Engineer's Estimate multiplied by the unit price bid. This total estimated cost of additional excavation shall be added to the lump sum bid for the General Construction Work for the purpose of comparing bids to determine the low bidder.

(C) Variations from Engineer's Estimate: The Engineer's Estimate of the quantity of excavation for which additional payment will be made is approximate only and is given solely to be used as a uniform basis for the comparison of bids and such estimate is not to be considered as part of this contract. The quantities actually required to complete the contract work may be more or less than the quantities in the Engineer's Estimate and, if so, no action for damages or for loss of profits shall accrue to the contractor by reason thereof.

33. Unit Price Contracts

(A) Comparison of Bids: Bids on Unit Price Contracts will be compared on the basis of a total estimated price,

arrived at by taking the sum of the estimated quantities of such items, in accordance with the Engineer's Estimate of Quantities set forth in the Bid Schedule, multiplied by the corresponding unit prices, and including any lump sum bids on individual items.

(B) Variations from Engineer's Estimate: Bidders are warned that the Engineer's Estimate of Quantities on the various items of work and materials is approximate only, given solely to be used as a uniform basis for the comparison of bids, and is not be considered part of this contract. The quantities actually required to complete the contract work may be less or more than so estimated, and if so, no action for damages or for loss of profits shall accrue to the contractor by reason thereof.

(C) Overruns: The terms and conditions applicable to overruns of unit price items are set forth in Article 26 of the Contract.

34. Excise Tax

Bidders are referred to the Specifications for information on Federal Excise Tax exemptions.

35. Licenses and Permits

The successful bidder will be required to obtain all necessary licenses and permits necessary to perform the work.

36. Multiple Prime Contractors

If more than one prime contractor will be involved on this project, all contractors are required to examine the Invitation for Bid packages for all other parts of the project.

37. Locally Based Enterprise Requirements (LBE)

This Contract is subject to the requirements of Administrative Code, Section 6-108.1, and the regulations promulgated thereunder. No construction contract will be awarded unless and until these requirements have been complied with in their entirety. The bidder is advised of the provisions set forth below, as well as the provisions with respect to the Locally Based Enterprise Program contained in Article 67 of the Contract. The contractor is advised that:

(A) If any portion of the Contract is subcontracted, not less than ten percent of the total dollar amount of the contract shall be awarded to locally based enterprises ("LBEs"); except, where less than ten percent of the total dollar amount of the Contract is subcontracted, such lesser percentage shall be so awarded.

(B) No contractor shall require performance and payment bonds from LBE subcontractors.

(C) No Contract shall be awarded unless the contractor first identifies in its bid:

(1) the percentage, dollar amount and type of work to be subcontracted; and

(2) the percentage, dollar amount and type of work to be subcontracted to LBEs.

(D) Within ten calendar days after notification of low bid, the apparent low bidder shall submit an "LBE Participation Schedule" to the contracting agency. If such schedule does not identify sufficient LBE subcontractors to meet the requirements of Administrative Code Section 6-108.1, the apparent low bidder shall submit documentation of its good faith efforts to meet such requirements.

(1) The "LBE Participation Schedule" shall include:

(a) the name and address of each LBE that will be given a subcontract,

(b) the percentage, dollar amount and type of work to be subcontracted to the LBE, and

(c) the dates when the LBE subcontract work will commence and end.

(2) The following documents shall be attached to the "LBE Participation Schedule":

(a) verification letters from each subcontractor listed in the "LBE Participation Schedule" stating that the LBE will enter into a formal agreement for work,

(b) certification documents of any proposed LBE subcontractor which is not on the LBE certified list, and

(c) copies of the certification letter of any proposed subcontractor which is an LBE.

(3) Documentation of good faith efforts to achieve the required LBE percentage shall include as appropriate but not limited to the following:

(a) attendance at prebid meetings, when scheduled by the agency, to advise bidders of contract requirements;

(b) advertisement where appropriate in general circulation media, trade association publications and small business media of the specific subcontracts that would be at least equal to the percentage goal for LBE utilization specified by the contractor;

(c) written notification to association of small, minority and women contractors soliciting specific subcontractors;

(d) written notification by certified mail to LBE firms that their interest in the contract is solicited for specific work items and their estimated values;

(e) demonstration of efforts made to select portions of the work for performance by LBE firms in order to increase the likelihood of achieving the stated goal;

(f) documented efforts to negotiate with LBE firms for specific subcontracts, including at a minimum:

(i) The names, address and telephone numbers of LBE firms that are contacted;

(ii) A description of the information provided to LBE firms regarding the plans and specifications for portions of the work to be performed;

(iii) Documentation showing that no reasonable price can be obtained from LBE firms;

(iv) A statement of why agreements with LBE firms were not reached;

(g) a statement of the reason for rejecting any LBE firm which the contractor deemed to be unqualified; and

(h) documentation of efforts made to assist the LBE firms contacted that needed assistance in obtaining required insurance.

(E) Unless otherwise waived by the Commissioner with the approval of the Office of Economic and Financial Opportunity, failure of a proposed contractor to provide the information required by paragraphs (C) and (D) above may render the bid non-responsive and the Contract may not be awarded to the bidder. If the contractor states that it will subcontract a specific portion of the work, but can demonstrate despite good faith efforts it cannot achieve its required LBE percentage for subcontracted work until after award of Contract, the Contract may be awarded, subject to a letter of compliance from the contractor stating that it will comply with Administrative Code Section 6-108.1 and subject to approval by the Commissioner. If the contractor has not met its required LBE percentage prior to award, the contractor shall demonstrate that a good faith effort has been made subsequent to award to obtain LBEs on each subcontract until its meets the required percentage.

(F) When a bidder indicates prior to award that no work will be subcontracted, no work may be subcontracted without the prior written approval of the Commissioner, which shall be granted only if the contractor in good faith seeks LBE subcontractors at least six weeks prior to the start of work.

(G) The contractor may not substitute or change any LBE which was identified prior to award of the contract without the written permission of the Commissioner. The contractor shall make a written application to the Commissioner for permission to make such substitution or change, explaining why the contractor needs to change its LBE subcontractor and how the contractor will meet its LBE subcontracting requirement. Copies of such application must be served on the originally identified LBE by certified mail return receipt requested,

as well as the proposed substitute LBE. The Commissioner shall determine whether or not to grant the contractor's request for substitution.

38. Bid Submission Requirements

The Bid Submission Requirements are set forth in the PASSPort RFx.

39. Comptroller's Certificate

This Contract shall not be binding or of any force unless it is registered by the Comptroller in accordance with Section 328 of the City Charter and the Procurement Policy Board Rules. This Contract shall continue in force only after annual appropriation of funds by the City of New York and certification as hereinabove set forth.

40. Procurement Policy Board Rules

This Invitation For Bids is subject to the Rules of the Procurement Policy Board of the City of New York. In the event of a conflict between said Rules and a provision of this Invitation For Bids, the Rules shall take precedence.

41. DDC Safety Requirements

The DDC Safety Requirements apply to the work to be performed pursuant to the Contract. The DDC Safety Requirements are set forth on the following pages.

THIS PAGE INTENTIONALLY LEFT BLANK

CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
SAFETY REQUIREMENTS FOR CONSTRUCTION CONTRACTS

January 2020

THE DDC SAFETY REQUIREMENTS FOR CONSTRUCTION CONTRACTS INCLUDE THE FOLLOWING SECTIONS:

I. POLICY ON SITE SAFETY

II. PURPOSE

III. DEFINITIONS

IV. RESPONSIBILITIES

V. SAFETY QUESTIONNAIRE

VI. SITE SAFETY PLAN

VII. KICK-OFF/PRE-CONSTRUCTION MEETINGS AND SAFETY REVIEW

VIII. EVALUATION DURING WORK IN PROGRESS

IX. SAFETY PERFORMANCE EVALUATION

I. POLICY ON SITE SAFETY

The City of New York Department of Design and Construction (DDC) is committed to a policy of injury and illness prevention and risk management for construction work that will ensure the safety and health of the workers engaged in the projects and the protection of the general public. Therefore, it is DDC's policy that work carried out by Contractors on DDC contracts must, at a minimum, comply with the most current versions of all applicable federal, state and city laws, rules, and regulations, including without limitation:

- Code of Federal Regulations, Title 29, Part 1926 (29 CFR 1926) and applicable Sub-parts of Part 1910 – U.S. Occupational Safety and Health Administration (OSHA);
- Federal Highway Administration – Manual on Uniform Traffic Control Devices (MUTCD);
- New York Codes, Rules and Regulations (NYCRR), Title 12, Part 23 – Protection in Construction, Demolition and Excavation Operations;
- New York Codes, Rules and Regulations (NYCRR), Title 16, Part 753 – Protection of Underground Facilities;
- New York City Administrative Code, Title 28 – New York City Construction Codes;
- Rules of the City of New York, Title 15, Chapter 13 – Rules Pertaining To the Prevention of the Emission of Dust from Construction Related Activities;
- Rules of the City of New York, Title 15, Chapter 28 – Citywide Construction Noise Mitigation;
- Rules of the City of New York, Title 34 Chapter 2 – NYCDOT Highway Rules.

The Contractor will be required to comply with all new and/or revised federal, state and city laws, rules, and regulations, issued during the course of the project, at the expense of the Contractor without any additional costs to the DDC.

II. PURPOSE

The purpose of this policy is to ensure that Contractors perform their work and supervise their employees in accordance with all applicable federal, state and city rules and regulations. Further, Contractors will be expected to minimize or eliminate jobsite and public hazards, through a planning, inspection, auditing and corrective action process. The goal is to control risks so that injuries, illnesses, and accidents to contractors' employees, DDC employees and the general public, as well as damage to city-owned and private property, are reduced to the lowest level feasible.

III. DEFINITIONS

Agency Chief Contracting Officer (ACCO): The ACCO will mean the person delegated authority by the Commissioner to organize and supervise the procurement activity of subordinate Agency staff in conjunction with the City Chief Procurement Officer (CCPO).

Competent Person: As defined by OSHA, an individual who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees or the general public, and who has authorization to take prompt corrective measures to eliminate them. This individual will have completed, at a minimum an authorized 30-hour OSHA Construction Safety Course. The Contractor may be required to provide more than one competent person due to construction operations and based on the number of active work sites.

Construction Safety Auditor: A representative of the Office of Construction Safety who provides inspection and assessment services to enhance health and safety on all DDC construction projects. The activities of the Construction Safety Auditor include performing site audits, reviewing safety plans, reviewing construction permits, drawings, verifying Contractor's compliance with applicable federal, state and city laws, rules, regulations, and DDC Contract Safety Requirements, etc. and rendering technical advice and assistance to DDC Resident Engineers and Project Managers.

Office of Construction Safety: A unit of DDC Safety and Site Support that assesses contractor's safety on DDC jobsites and advises responsible parties of needed corrective actions.

Registered Construction Superintendent: For certain projects, as defined in New York City Construction Codes – Title 28, the contractor will provide a Construction Superintendent registered with the NYC Department of Buildings and responsible for all duties as defined in Chapter 33 of Title 1 of the Rules of the City of New York.

Contractor: For purposes of these Safety Requirements, the term "Contractor" will mean any person or entity that enters into a contract for the performance of construction work on a DDC project. The term "Contractor" will include any person or entity which enters into any of the following types of contracts: (1) a prime construction contract for a specific project, (2) a prime construction contract using the Job Order Contracting System ("JOCS Contract"), and (3) a subcontract with a CM/Builder ("First Tier Subcontract").

Daily Safety Job Briefing: Daily jobsite safety briefings, given to all jobsite personnel at project site by the Contractor before work begins and/or if hazards or potential hazards are discovered while working, with the purpose of discussing the scheduled activities for the day, the hazards related to these activities, activity specific safety procedures, and Job Hazard Analysis associated with the scheduled construction work. Daily jobsite briefings will be documented, available at the jobsite, and will include at a minimum, topics, name and signature of the person conducting the briefing session, names and signatures of attendants, name of the designated competent person, contactor's name, DDC Project ID, date, time, and location.

Director – Office of Construction Safety: Responsible for the operations of the Office of Construction Safety and the DDC Site Safety management programs.

Job Hazard Analysis (JHA): A process of identifying the major job tasks and any potential site-specific hazards that may be present during construction and establishing the means and methods to eliminate or control those hazards. A JHA will be documented, available at the jobsite and will include at a minimum work tasks, being performed, identified hazards, control methods for the identified hazards, contractor's name, DDC Project ID, location, date, name and signature of certifying person. A JHA is a living document that will be re-evaluated and revised to address new hazards and tasks that may develop and will be present at the worksite and produced upon request.

Qualified Person: As defined by OSHA, an individual who, by possession of a recognized degree, certificate, license, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his or her ability to solve problems relating to the subject matter, the work, or the project. Qualified Persons are required under regulation to address issues pertaining, but without limit, to fall protection, scaffold design, maintenance and protection of traffic, and excavation protective system, among others.

Project Site: Those areas indicated in the Contract Documents where the Work is to be performed.

Project Safety Representative: The designated Project Safety Representative will have at a minimum an OSHA 30-hour Construction Safety Course and other safety training applicable to Contractor's/subcontractor's project work. This individual will be responsible to oversee safety performance of the required construction work, conduct documented daily safety inspections, and implement corrective actions to maintain a safe work site. The Project Safety Representative must have sufficient experience and skills necessary to thoroughly understand the health and safety hazards and controls and must have authority to undertake corrective actions. A dedicated full-time Project Safety Representative may be required on large projects and projects deemed by DDC to be particularly high risk. DDC reserves the right to request a dedicated full-time Project Safety Representative for any reason at any time during the course of the project at the expense of the Contractor without any additional costs to the DDC. The full-time Project Safety Representative will be present at the site during all work activities.

Resident Engineer ("RE"): Representative of the Commissioner duly designated by the Commissioner to be his/her representative at the site of the work. The RE may be a consultant retained by DDC, including a Construction Management (CM) or Resident Engineer Inspection (REI) firm. If DDC has retained a CM, REI or other consultant firm to perform management and oversite for the Project (e.g., CM-Builder, CM-Design-Builder, Project Manager, Program Manager), that CM, REI or other consultant is the Resident Engineer for purposes of these Safety Requirements.

Safety Questionnaire: Used by DDC to evaluate Contractor's current and past safety performance. It is required to be completed by all Contractors initially when submitting bids for Construction work, or when being pre-qualified

and updated annually or as requested by the DDC.

Site Safety Manager: For certain projects, as defined in New York City Construction Codes – Title 28, the Contractor will provide a Site Safety Manager with a Site Safety Manager License issued by the New York City Department of Building.

Site Safety Plan: A site-specific safety plan developed by the Contractor for a DDC project. The Site Safety Plan will identify the project work scope, identify hazards associated with the project work and include project specific safety procedures and training appropriate and necessary to complete the work. The Site Safety Plan will be submitted within 30 days from the Award Date or as otherwise directed and is subject to review and acceptance by the Office of Construction Safety prior to the commencement of work at the site.

Unsafe or Unhealthy Condition: A condition that could be potentially hazardous to the health and safety of personnel or the public, and/or damaging to equipment, machinery, property, or the environment.

Weekly Safety Meetings: Weekly jobsite safety meetings, given to all jobsite personnel by Contractor, with the purpose of discussing general safety topics and job specific requirements encountered at the DDC work site. Weekly safety meetings will be documented and will include at a minimum, topics, name and signature of the person conducting the meeting, names and signatures of attendees, contractor's name, DDC Project ID, date, and location.

Work: The construction required by the Contractor's Contract Documents whether completed or partially completed, performed by the Contractor/ subcontractors. Work refers to the furnishing of labor, furnishing and incorporating materials and equipment into the construction and providing any service required by the Contract Documents to fulfill the Contractor's obligation to complete the Project. For the purposes of these Safety Requirements, the term "Work" includes all Utility Interference work (commonly referred to as "Section U", "EP-7", and "Joint Bid" work) performed in association with this Contract.

IV. RESPONSIBILITIES

All persons who manage, perform, and provide support for construction projects will conduct operations in compliance with the requirements identified in this Policy and all applicable governing regulatory agency requirements and guidelines pertaining to safety in construction.

A. Resident Engineer

1. Review and facilitate Contractor(s) Site Safety Plan submittals to DDC for acceptability.
2. Notify the Office of Construction Safety of the commencement of construction work.
3. Develop and implement a training verification process to ensure that all CM/REI, consultant, Contractor, and subcontractor employees are properly trained. Maintain all applicable initial and refresher training records and assures documentation availability on site.
4. Maintain documentation of and attend weekly safety meetings and daily safety job briefings.
5. Assure that Contractor(s) JHA's are current to reflect the work tasks being performed, hazards, and control methods to mitigate the identified hazards. Verify that all employees at the job site are trained on the JHAs and maintain supporting documentation on site.
6. Assure adequate planning for all critical construction activities (crane operation, excavation, confined space entry, etc.) including coordination between Contractor(s) /DDC/ other Agencies as required.
7. Maintain custody of all construction related permits, plans, approvals, drawings, etc., related to the project and assure their availability on site.
8. Recognize, minimize, or eliminate jobsite and public hazards, through required planning, inspection, verification, and corrective action process.
9. Monitor the conditions at the site for conformance with the Contractor's Site Safety Plan, DDC policies, permits, and all applicable regulations and documentation that pertain to construction safety.
10. Notify the Contractor and DDC immediately upon determination of any condition or activity existing which is not in compliance with the Contractor's Site Safety Plan, applicable federal, state or local codes or any

condition that presents a potential risk of injury to the public or workers or possible damage to property. Direct the Contractor to provide such labor, materials, equipment, and supervision to remedy such conditions.

11. Notify the Office of Construction Safety and the ACCO's Insurance and Risk Management Unit of project-related accidents, incidents, and near misses as per DDC's Construction Safety Emergency and Accident Notification and Response Procedure within two (2) hours.
12. In case of an accident, incident, or near miss, RE is responsible to protect the integrity of the accident site including but not limited to: the safeguarding of all evidence, documentation of all personnel on site at the time of the accident, gather facts related to all accidents, incidents, or near miss, and prepare required DDC Construction Accident Report as per DDC's Construction Safety Emergency and Accident Notification and Response Procedure. Maintain all records pertaining to accidents, incidents, and near miss and have them available upon request.
13. Notify the Office of Construction Safety within two (2) hours of the start of an inspection by any outside/ regulatory agency personnel, including NYS, OSHA, NYC DOB or any other City/State/Federal oversight entity and forward a copy of the inspection report within one business day of its receipt.
14. Escort and assist Construction Safety Auditors during all field and record audits.
15. Report any emergency conditions to the Office of Construction Safety immediately.

Note: In addition to the responsibilities listed above, if the Resident Engineer is a CM/REI or other non-City party hired by the City to manage the Project, the Resident Engineer is also required to do the following:

16. Provide personnel who are certified and or trained appropriately for the requirements of the project.
17. Perform an investigation for any project-related accidents, incidents, and near misses. Within 24-hours of the time of the accident, incident, or near miss, the CM/REI will submit an investigation report to the Office of Construction Safety. Such report will include proposed remedial measures and implementation of corrective actions to prevent recurrence.

DDC reserves the right to request that the CM/REI replace any CM/REI personnel for any reason at any time during the project.

B. Construction Contractors

Note: For CM-Build and CM-Design-Build Projects, the CM will meet all requirements listed in this section, as well as the Resident Engineer section above.

1. Submit a completed Safety Questionnaire and other safety performance related documentation with its bid or as part of a pre-qualification package.
2. Submit a Site Safety Plan within 30 days from the Award Date or as otherwise directed. The Site Safety Plan is subject to review and acceptance by the Office of Construction Safety prior to the commencement of work at the site. The Site Safety Plan will be revised and updated as necessary during the course of the project. If requested by the Office of Construction Safety, the Site Safety Plan must be developed and submitted for approval using a web-based system, the Site Safety Plan Application (SSP App).
3. Designate and identify a Project Safety Representative in the Site Safety Plan. The Contractor will immediately notify the Office of Construction Safety, in a form and manner acceptable to the Office of Construction Safety, of any permanent change to the designated Project Safety Representative. In the event the primary designated Project Safety Representative is temporary unable to perform his or her duties, an alternate Project Safety Representative will be provided. Resumes, outlining the qualification and experience for the Project Safety Representative (s) will be included in the Site Safety Plan and available upon request. DDC reserves the right to request the Contractor to replace a Project Safety Representative for any reason at any time during the course of the project.
4. Designate and identify a Competent Person(s) in the Site Safety Plan. Contractor/subcontractor may be required to provide more than one competent person due to construction operations and based on a number of work tasks/areas. DDC reserves the right to request the Contractor to replace a Competent Person or provide additional Competent Person(s) for any reason at any time during the course of the project. The Competent Person will be present at the site during all work activities.
5. For certain projects, as defined in New York City Construction Codes – Title 28, designate and identify the Licensed Site Safety Manager or Registered Construction Superintendent. Resumes, outlining the qualification and experience for the Licensed Site Safety Manager or Registered Construction Superintendent will be included in the Site Safety Plan and available upon request. The Contractor will immediately notify the Office

of Construction Safety, in a form and manner acceptable to the Office of Construction Safety, of any permanent change to the designated Site Safety Manager and/or Construction Superintendent. In the event the primary designated Site Safety Manager or Construction Superintendent is temporarily unable to perform his or her duties, an alternate Licensed Site Safety Manager and/or Registered Construction Superintendent will be provided. The Office of Construction Safety must be informed of such change. DDC reserves the right to request the Contractor to replace Site Safety Manager or Construction Superintendent for any reason at any time during the course of the project.

6. Develop a written Job Hazard Analysis (JHA) that identifies safety hazards and control methods for project specific work tasks. A preliminary JHA will be included in the Site Safety Plan submitted by the Contractor. A JHA is a living document that will be re-evaluated and revised to address new hazards and tasks that may develop during the course of the project and will be present at the worksite and produced upon request.
7. Develop project specific safety procedures to protect employees, general public, and property during all construction activities for the duration of the project.
8. Ensure that all employees are aware of the hazards associated with the project through documented formal and informal training and/or other communications. Conduct and document new employee and site-specific safety orientation for all Contractor and subcontractor personnel to review the hazards associated with the project as identified in the Site Safety Plan and the specific safety procedures and controls that will be used to protect workers, the general public and property. The Project Safety Representative will conduct this training prior to mobilization and if necessary during the course of the project. Documentation will be provided to the RE.
9. Prior to performing any work on DDC projects all Contractor's and subcontractor's employees will, at a minimum, have successfully completed, within the previous five calendar years, an OSHA 10-hour construction safety course.

   All training records (OSHA 10-hour, flagger, scaffold, fall protection, confined space, etc.) will be provided to the RE prior to mobilization, included in the Site Safety Plan, kept current during the course of the project, and available for review.
10. Conduct and document weekly safety meetings and daily job briefing sessions for the duration of the project. Attendance at weekly safety meetings and daily job briefing sessions is mandatory. A written record of weekly safety meetings will be available upon request and job briefing sessions will be available at the worksite.
11. As part of the Site Safety Plan, prepare site specific procedures, such as maintenance and protection of traffic plan, steel erection plan, confined space program, fall protection plan, demolition plan, site specific emergency evacuation plan, etc. (if not otherwise provided in the contract documents) and comply with all of its provisions.
12. Have immediately available for review at the project site where actual construction activities are being performed all applicable documentation, including but not limited to: JHAs for work tasks being performed, all required training records, MPT plan (where applicable), Noise and Dust Mitigation Plans, excavation protective system drawings (where applicable), Emergency Evacuation plan, fall protection program (where applicable), confined space program (where applicable), all required permits, daily job briefing records, all required documentation for crane operation (where applicable), daily inspection checklist, scaffold and sidewalk drawings (when applicable), safety data sheets for chemicals in use.
13. Comply with all federal, state and local safety and health rules, laws, and regulations.
14. Comply with all provisions of the Site Safety Plan.
15. Provide, replace, and adequately maintain at or around the project site, suitable and sufficient signage, lights, barricades and enclosures (fences, sidewalk sheds, netting, bracing, etc.). The project specific MPT plan will be developed, implemented, and reviewed during the course of the project.
16. The Project Safety Representative will conduct daily safety inspections, document the inspection results, implement corrective actions for the identified hazards. Maintain the inspection records and have them available upon request.
17. **Report unsafe or unhealthy conditions to the RE as soon as practical, but no more than 24 hours after discovery, and take prompt actions to remove or abate such conditions. Should an imminent dangerous condition be discovered, Contractor will stop all work in the area of danger until corrections are made.**
18. Report all accidents, incidents and near misses involving injuries to workers or the general public, as well as property damage, to the RE within one (1) hour.
19. Following an accident or incident, unless otherwise directed, the Contractor will not remove or alter any equipment, structure, material, or evidence related to the accident or incident. Exception: Immediate emergency procedures taken to secure structures, temporary construction, operations, or equipment that pose a continued imminent danger or facilitate assistance for persons who are trapped or who have sustained bodily injury. Take

additional measures as necessary to secure the accident or incident site and to protect against any further injury or property damage.

20. The Contractor will perform an investigation into the root cause of the accident, incident, or near miss. Within 24 hours of an accident, incident, or near miss, the Contractor will prepare and submit to the RE a written investigation report detailing findings, corrective actions, and hazard mitigation implementation to prevent recurrence.
21. Notify the RE within two (2) hours of the start of an inspection by any outside regulatory agency personnel, including OSHA, NYC DOB, or others.
22. Maintain all records pertaining to all required safety compliance documents, accidents and incidents reports. DDC reserves the right to request copy of any records pertaining to the safety of the project and required by DDC and other federal, state, and city agencies, including but not limited to permits, training records, safety inspection records, drawings, equipment records, etc.
23. Cooperate with DDC Office of Construction Safety/ RE and address DDC recommendations on safety, which will in no way relieve the Contractor of its responsibilities for safety on the project. The Contractor has sole responsibility for safety.

V. SAFETY QUESTIONNAIRE

DDC requires that all Contractors provide information regarding their current and past safety performance and programs. This will be accomplished by the use of the DDC Safety Questionnaire. As a part of the bid submittal package, the contractor will submit a completed DDC Safety Questionnaire listing company workers' compensation experience modification rating and OSHA Incident Rates for the three (3) years prior to the date of the bid opening. DDC may request a Contractor to update its Questionnaire at any time or to provide more detailed information. The Contractor will provide the requested information within 15 days.

The following criteria will be used by DDC in reviewing the Contractor's responsibility, which will be based on the information provided on the questionnaire:

Criteria 1: OSHA Injury and Illness Rates (I&IR) are no greater than the average for the industry (based on the most current Bureau of Labor Statistics data for the Contractors SIC code); and

Criteria 2: Insurance workers compensation Experience Modification Rate (EMR) equal to or less than 1.0; and

Criteria 3: Any willful violations issued by OSHA or NYC DOB within the last three (3) years; and

Criteria 4: A fatality (worker or member of public) and injuries, requiring OSHA notification, experienced on or near Contractor's worksite within the last three (3) years; and

Criteria 5: Past safety performance on DDC projects (accidents; status of site safety plan submittals; etc.)

Criteria 6: OSHA violation history for the last three (3) years;

Criteria 7: Contractor will provide OSHA Injury and Illness Records (currently OSHA 300 and 300A Logs) for the last three (3) years.

If the Contractor fails to meet the basic criteria listed above, the Office of Construction Safety may request, through the ACCO, more details concerning the Contractor's safety experience. DDC may request the Contractor to provide copies of, among other things, accident investigation reports, OSHA records, OSHA and NYC DOB citations, EPA citations and written corrective action plan.

VI. SITE SAFETY PLAN

Within thirty (30) days from the Award Date or as otherwise directed, the Contractor will submit the Site Safety Plan. The Site Safety Plan will identify project work scope, safety hazards associated with the project tasks, and include specific safety procedures and training appropriate and necessary to complete the work. The Site Safety Plan is subject to review and acceptance by the Office of Construction Safety prior to the commencement of work at the site. Due to the project work scope and project duration, the Office of Construction Safety may grant a conditional acceptance for a Site Safety Plan without all sections being complete. In a case of a "Conditional Acceptance" of a Site Safety Plan,

the Contractor will provide the remaining sections previously incomplete and/or not submitted for review and acceptance by the Office of Construction Safety prior to the commencement of the construction activities. The Office of Construction Safety reserves the right to withdraw the initial "Conditional Acceptance" if the Contractor fails to provide the remaining sections of a Site Safety Plan. Failure by the Contractor to submit an acceptable Site Safety Plan will be grounds for default.

Site Safety Plan requirements: The Site Safety Plan will be a written document and will apply to all project specific Contractor and subcontractor operations, and will have at a minimum, the following elements with each described in a separate section (It may be necessary to modify the basic format for certain unique or high-risk projects, such as tunnels or high-rise construction). All Site Safety Plan sections will be numbered in the order listed below. For sections, which are not applicable for the type of the work being performed by the Contractor on DDC project, the Contractor will in writing indicate "Not applicable based on the project work scope." The Site Safety Plan will include Contractor's name, DDC project ID, project location (s), and development and revision dates. The Site Safety Plan will include the sections, attachments, and appendixes provided in the Site Safety Plan. All pages of the Site Safety Plan will be numbered. If requested by the Office of Construction Safety, the Site Safety Plan must be developed and submitted for approval using a web-based system, the Site Safety Plan Application (SSP App).

1. Project Work Scope – Detailed information regarding work tasks that will be performed by Contractor and subcontractors under the project.
2. Responsibility and Organization – Contractor's organization chart with responsible personnel for the project, including titles, names, contact information, roles, and responsibilities. All Contractor's personnel required by the DDC Safety Requirements will be identified.
3. Safety Training and Education – OSHA 10 Hours training, requirements for daily safety briefings and weekly safety meetings, any work task specific training, responsible staff for implementation of training program for the project.
4. Job Hazard Analysis (JHA) – Project specific Job Hazard Analysis including work tasks, identified hazards, hazard control methods (administrative, engineering, PPE) to protect workers, property and general public, Contractor's name, project id, location, name and signature of a certifying person, hazard assessment date.
5. Protection of Public – Project specific procedures covering safety of the general public during all project construction activities.
6. Hazard Corrective Actions - Procedures for hazard identification, including responsible person(s), frequency of safety inspections, implementation of corrective actions, safety inspection checklist.
7. Accident/Exposure Investigation – Project specific procedures for accident/incident/near miss investigation and implementation of corrective actions. Accident/incident/near miss notification procedure of DDC project staff (timer frame and responsible personnel).
8. Recording and Reporting Injuries – Procedures to meet 29 CFR 1904 requirements.
9. First Aid and Medical Attention – Responsible staff, location and inspection of First Aid kit, directions to local hospitals; emergency telephone numbers.
10. Project Specific Fire Protection and Prevention Program – Project specific procedures, including responsible staff, fire alarm system/methods, hot work procedures, etc.
11. Housekeeping Procedure.
12. Project Specific Illumination Procedure.
13. Project Specific Sanitation Procedure.
14. Personal Protective Equipment (PPE), including Respiratory Protection Program and Hearing Conservation Program, if required.
15. Hazard Communication Program – Contractor's Hazard Communication Program, responsible staff; training; SDS records, project specific list of chemicals; location of the program and SDS records.
16. Means of Egress – Information regarding free and unobstructed egress from all parts of the building or structure; exit marking; maintenance of means of egress, etc.
17. Employee Emergency Action Plan – Project specific: responsible staff, emergency alarm system/devices, evacuation procedure, procedure to account for employees after evacuation, etc.
18. Evacuation Plan – Project specific evacuation plan (drawing/scheme) with exists and evacuation routes.
19. Ionizing/Nonionizing Radiation – Competent person, license and qualification requirements, type of radiation, employee's exposure and protection, safety procedures, etc.

20. Material Handling, Storage, Use and Disposal – Project specific information regarding material storage, disposal, and handling: procedures, plan/drawings, etc.
21. Signs, Signals, and Barricades – Use of danger/warning signs, safety instruction signs, sidewalk closure and pedestrian fencing and barricades (if not included in the MPT plan), etc.
22. Tools – Hand and Power – Safety procedures for the type of tools to be used.
23. Scaffold – Project specific scaffold types, procedures, training requirements, scaffold drawings, designed, sealed, and signed by NYS Licensed Professional Engineer, or as otherwise directed; competent person, criteria for project specific scaffold, falling object protection, procedures for aerial lifts/scissor lifts.
24. Welding and Cutting – Project specific procedure for welding and cutting, including all necessary safety requirements such as fire prevention, personal protective equipment, hot work permits (if not covered by Contractor's Fire Prevention and Protection program, FDNY certificate requirements).
25. Electrical Safety – Project specific procedures, including lock out-tag out.
26. Fall Protection – Project specific information regarding selected fall protection systems, fall protection plan, responsible staff.
27. Cranes, Derrick, Hoists, Elevators, Conveyors – project specific equipment information including type, rated load capacity, manufacture specification requirements, competent person, exposure to falling load, inspection, recordkeeping, clearance requirements, communication procedure, ground lines, permits.
28. Excavation Safety – Competent person; excavation procedures; project specific protective system, including drawings, designed, sealed, and signed by NYS Licensed Professional Engineer, or as otherwise directed.
29. Protection of Underground Facilities and Utilities Procedure, including responsible staff and responsibilities.
30. Concrete and Masonry Construction Procedures
31. Maintenance and Protection of Traffic Plan – Project specific MPT plan, designed, sealed, and signed by NYS Licensed Professional Engineer, or as otherwise directed; flagmen training, public safety, etc.
32. Steel Erection – Site specific erection plan, requirements for applicable written notifications, competent person, fall protection plan, training requirements, etc.
33. Demolition – Engineering survey, including written evidence, disconnection of all effected utilities, identification of all hazardous chemicals, materials, gases, etc., floor openings, chutes, inspection and maintenance of all stairs/passageways, removal of materials/debris/structural elements, lock out/tag out, competent person.
34. Blasting and the Use of Explosives – Project specific safety procedures, warning signs, training/qualification, transportation, storage and use of explosives, inspection.
35. Stairways and Ladders – Types of stairs and ladders, safety procedures, training requirements.
36. Alcohol and Drug Abuse Policy
37. Rodents and Vermin Controls
38. Toxic and Hazardous Substances – Safety procedures for substances that Contractor's and subcontractor's employees can be exposed on project.
39. Noise Mitigation Plan – Completed project specific Noise Mitigation Plan, and noise mitigation procedures.
40. Confined Space Program – Project specific Confined Space Program, responsible staff, training records, equipment information, rescue procedure, list of project specific confined spaces, forms.
41. Construction Vehicles/Heavy Equipment – Type of construction vehicles/heavy equipment to be used on site, procedures
42. Dust Mitigation Plan – Completed project specific Dust Mitigation Plan, and dust mitigation procedures.
43. Working Over and Near Water. Diving Operations – safety procedures including personal protective equipment, fall protection, rescue services, etc.

The most critical component of the Site Safety Plan is the Job Hazard Analysis (JHA) section. The JHA form is a written document prepared by the Contractor. The Contractor will conduct a site and task assessment to identify the tasks and any potential safety or environmental hazards related to performance of the work, eliminate or implement controls for the potential hazards, and identify proper personal protective equipment for the task. The JHA will be communicated to all Contractor/subcontractor personnel on site. The JHA will include safety hazard identification and controls to protect employees, general public, and property.

The initial JHA will be included in the Contractor's Site Safety Plan and the current JHA form will be available at the construction site for reference. A JHA is a living document that will be re-evaluated and revised to address new hazards and tasks that may develop and will be present at the worksite and produced upon request.

VII. KICK-OFF MEETINGS/PRE-CONSTRUCTION AND SAFETY REVIEW

Prior to the start of construction activities on all DDC projects, RE will invite the Office of Construction Safety to the construction kick-off meeting. The Office of Construction Safety representative(s) will participate in this meeting with the Contractor and RE for the purpose of:

A. Reviewing DDC Contract Safety Requirements
B. Reviewing site-specific safety issues based on a project work scope, location, and any other factors which may impact safety of workers and general public.
C. Reviewing the Site Safety Plan and JHA requirements.
D. Reviewing Accident/Incident reporting and investigation procedures.
E. Reviewing designated safety contacts, roles, and responsibilities.
F. Discussing planned inspections and audits of the site by the Office of Construction Safety personnel.

VIII. EVALUATION DURING WORK IN PROGRESS

The Contractor's adherence to these Safety Requirements will be monitored throughout the project. This will be accomplished by the following:

A. Use of a safety checklist by a representative of the Office of Construction Safety (or other designated DDC representative) and the RE during regular inspections and comprehensive audits of the job site. Field Exit Conferences will be held with the RE and Contractor Project Safety Representatives.
B. The RE will continually monitor the safety and environmental performance of the Contractor's employees and work methods. Deficiencies will be brought to the attention of the Contractor's Project Safety Representative on site for immediate correction. The RE will maintain a written record of these deficiencies and have these records available upon request. Any critical deficiencies will be immediately reported to the Office of Construction Safety via telephone (718)391-1911.
C. If the Contractor's safety performance during the project is not up to DDC standards (safety performance measure, accident/incident rate, etc.) the Director – Office of Construction Safety, or his/her designee will meet with the Contractor's Project Safety Representative and other representatives, the RE, and the DDC Environmental Specialist (if environmental issues are involved). The purpose of this meeting is to 1) determine the level of non-compliance; 2) explain and clarify the safety/environmental provisions; 3) agree on a future course of action to correct the deficiencies.
D. If the deficiencies continue, the Commissioner may, without limitation, declare the Contractor in default.
E. The Contractor will within 1 hour inform the RE of all accidents/incidents/near misses including all fatalities, any injuries to employees or members of the general public, and property damage (e.g., structural damage, equipment rollovers, utility damage, loads dropped from crane). The RE will notify the Office of Construction Safety as per DDC's Construction Safety Emergency and Accident Notification and Response Procedure and will maintain a record of all Contractor accidents/incidents for the project.
F. The Contractor and the RE will notify the Office of Construction Safety within two (2) hours of the start of any NYS-DOL/ NYC-COSH/ OSHA/ EPA inspections.

IX. SAFETY PERFORMANCE EVALUATION

The Contractor's safety record, including accident/incident history and DDC safety inspection results, will be considered as part of the Contractor's performance evaluation at the conclusion of the project. Poor safety performance during the course of the project will be a reason to rate a Contractor unsatisfactory which may be reflected in the City's PASSPort system and will be considered for future procurement actions as set forth in the City's Procurement Policy Board Rules.

NOTICE TO BIDDERS

Please be advised that the following Riders to the March 2017 New York City Standard Construction Contract have been attached and incorporated in this Invitation for Bid:

- Rider regarding Community Hiring for Construction Contracts;
- Rider regarding Non-Compensable Delays and Grounds for Extension;
- Rider regarding NYC Earned Safe and Sick Time Act;
- Rider regarding City Fleet and Truck Safety Requirements for City Contractors.

Other than provisions specifically delineated in the Riders, all other terms of the March 2017 New York City Standard Construction Contract continue to apply in full force and effect.

Community Hiring Rider

For Construction Contracts

Version: February 20, 2025

Program Description

Community Hiring, as authorized under Chapter 79 of the New York City Charter ("Charter"), is an initiative to set workforce goals on City procurement for contractors to employ low-income individuals and residents of economically disadvantaged communities.

The provisions set forth in this Rider shall apply to contracts with a total value exceeding three million dollars, unless otherwise exempt under the rules set forth under the Community Hiring Rules, adopted as Title 74 of the Rules of the City of New York (RCNY). Under 74 RCNY § 1-03(b), the following contracts are exempt: preferred source contracts; contracts for the performance of services by a city-affiliated not-for-profit corporation, goods contracts; contracts in an amount below the small purchase threshold; contracts for investigative or confidential services; contracts subject to federal or state funding requirements that preclude or substantially conflict with the application of Community Hiring Goals; contracts awarded through the United States General Services administration, or through the New York State Office of General Services; contracts for emergency demolition services procured by the Department of Housing Preservation and Development; contracts for which contractor selection is made by an elected official other than the Mayor or an agency other than a Mayoral Agency; contracts subject to 9 RCNY § 1-02(f); contracts designated for inclusion in a mentoring program as defined in Section 1206 or 1309 of the Charter; and contracts for banking services, electronic payment services, or other related services procured by the New York City Department of Finance.

The Community Hiring Rules are hereby incorporated in this Contract by reference and all terms used herein shall have the meanings given such terms in the Community Hiring Rules. In the event of any conflict between the Community Hiring Rules and this Rider, the rules shall control. As of the execution of this Contract, the Contactor represents that it has read, in its entirety, and agrees to comply with the Community Hiring Rules.

The Community Hiring program supersedes the HireNYC initiatives and the related riders, including, but not limited to references to the Public Assistance Commitment Rider and the HireNYC Hiring and Employment Rider. Article 35.6 of this Contract is amended and replaced with the Community Hiring Rules.

Community Hiring Requirements

The Contractor agrees to comply with the requirements of the Community Hiring Rules in the performance of this Contract.

A. Community Hiring Goal

Pursuant to 74 RCNY § 4-02(b), the Contractor shall make best efforts to meet the applicable Community Hiring Goal to employ Residence-Based Community Hires as defined in 74 RCNY § 2-01(a) for contracts involving construction work.

For each Contract involving Construction Work that is not subject to a Project Labor Agreement, the Contractor shall agree to make best efforts to meet the Community Hiring Goal of 30 percent of cumulative labor hours of construction work to be performed by Residence-Based Community Hires as established in 74 RCNY § 4-02(b)(1). For contracts involving Construction Work that are subject to a Project Labor Agreement, the Contractor shall agree to make best efforts to meet the numerical goal(s) regarding Residence-Based Community Hires and Apprentices established in such Project Labor Agreement.

In accordance with 74 RCNY § 5-01(b), the Contractor shall require its subcontractors, as defined under 74 RCNY § 1-02, to make best efforts to meet the applicable Community Hiring Goal.

B. Advertising Employment Opportunities

The Contractor, except those performing Construction Work pursuant to a Project Labor Agreement, agrees to advertise the Employment Opportunities, as defined in 74 RCNY § 1-02, in conspicuous places available to the public and in a manner reasonable for the industry.

For purposes of meeting a Community Hiring Goal, the Contractor shall notify a Referral Source, as provided in accordance with 74 RCNY § 3-02(a), of the job opportunities to be filled by Community Hires. The Contractor shall provide notice to the Office of Community Hiring and Workforce Development (OCH) when the Referral Source has impeded the Contractor's efforts to meet the Community Hiring Goal.

C. System Enrollment and Reporting

The Contractor shall enroll with an electronic system designated by the Director of OCH in accordance with 74 RCNY § 5-01(e).

Once enrolled into the system, the Contractor shall be responsible for updating the information in the system in a reasonable and timely manner.

The Contractor may fulfill the advertising requirement set forth in 74 RCNY § 5-01(c) by posting in such system all the relevant information of an Employment Opportunity to be filled by Community Hires. The Contractor shall also provide, upon request by the City with reasonable notice, any information related to the Contractor's compliance with or progress towards meeting the Community Hiring Goal.

Records

A. Retention

The Contractor shall maintain records in accordance with the applicable requirements set forth in 74 RCNY §§ 6-01 and 6-02.

For purposes of 74 RCNY § 6-01(b), the Contractor shall designate a representative to monitor all activity related to compliance to ensure that the Contractor is exercising best efforts to meet the Community Hiring Goal and maintain records to submit the documentation relating to the provisions herein.

B. Access to Records

The Contractor shall furnish, and require its subcontractors to furnish, all information and reports in accordance with the laws, rules, regulations or guidance from the City.

Compliance

Without limitation to any other provisions under this Contract and any other remedies available to the City, a failure to comply with the requirements under the Community Hiring Rules is a non-compliance that may be subject to civil penalties pursuant to Chapter 7 of the Community Hiring Rules and may be considered as a factor in evaluating contract performance in accordance with 9 RCNY § 4-01.

A. Best Efforts

Where the Contractor has failed to meet the Community Hiring Goal, the Contractor shall demonstrate that it exercised best efforts to meet the goal. Where determined, as set forth in 74 RCNY § 5-03, that the Contractor failed to make best efforts, the City shall send written notice to the Contractor's designated representative, notwithstanding the notice provisions in the Contract. The Contractor shall respond in accordance with the instructions in the notice. Failure to timely respond can result in a non-compliance determination subject to civil penalties as set forth in 74 RCNY § 7-01.

B. Corrective Action

Where the City determines that the non-compliance may be remedied through a corrective action and provides notice to the Contractor pursuant to 74 RCNY § 7-02(a)(2), the Contractor shall respond in accordance with the requirements outlined in the notice. The Contractor is responsible for timely demonstration of taking the requisite corrective action. Demonstration of corrective action to the satisfaction of the Director of OCH, may result in waiving of the civil penalties[1] as set forth in the Community Hiring Rules.

[1] Only civil penalties relating to non-compliance with the Community Hiring Rules can be waived in this instance.

C. Civil Penalties

Where Contractor is found non-compliant subject to civil penalties, the City can impose a civil penalty amount in accordance with the schedule set forth in 74 RCNY § 7-03.

The City may withhold from the Contractor the amount of the civil penalties upon final determination as set forth in 74 RCNY § 7-01(d).

RIDER TO NEW YORK CITY STANDARD CONSTRUCTION CONTRACT (MARCH 2017) REGARDING NON-COMPENSABLE DELAYS AND GROUNDS FOR EXTENSION

The following provisions supersede the corresponding provisions in the March 2017 version of the New York City Standard Construction Contract:

1. Section **11.5.1** provides as follows:

   11.5.1 The acts or omissions of public or government bodies (other than **City** agencies) or of any third parties who are disclosed in the **Contract Documents,** or those third parties who are ordinarily encountered or who are generally recognized as related to the **Work**, including but not limited to, **Other Contractors**, utilities or private enterprises;

2. Section **11.5.6** provides as follows:

   11.5.6 Climatic conditions, storms, floods, droughts, tidal waves, fires, hurricanes, earthquakes, landslides or other catastrophes or acts of God; acts of war or of the public enemy or terrorist acts; disruption, outage or power failure caused by a utility's inability or failure to provide service, pandemics, epidemics, outbreaks of infectious disease or any other public health emergency; other states of emergency declared by the City, State or Federal government , quarantine restrictions, and freight embargoes; including the **City's** reasonable responses to any of the above; and

3. Section **13.3** provides as follows:

   13.3 Grounds for Extension: If such application is made, the **Contractor** shall be entitled to an extension of time for delay in completion of the **Work** caused solely:

   13.3.1 By any of the acts or omissions of the **City**, its officials, agents or employees set forth in Articles **11.4.1.1** through **11.4.1.9**; or

   13.3.2 By or attributable to any of the items set forth in Articles **11.5.1** through **11.5.7**.

   13.3.3 The **Contractor** shall, however, be entitled to an extension of time for such causes only for the number of **Days** of delay which the **ACCO** or the Board may determine to be due solely to such causes, and then only if the **Contractor** shall have strictly complied with all of the requirements of Articles 9 and 10.

NYC EARNED SAFE AND SICK TIME ACT CONTRACT RIDER

(To supersede Section 4.06 of the January 2018 Appendix A and Section 35.5 of the March 2017 Standard Construction Contract and to be attached to other City contracts and solicitations)

A. *Introduction and General Provisions.*

1. The Earned Safe and Sick Time Act ("ESSTA"), codified at Title 20, Chapter 8 of the New York City Administrative Code, also known as the "Paid Safe and Sick Leave Law," requires covered employees (as defined in Admin. Code § 20-912) in New York City ("City") to be provided with paid safe and sick time. Contractors of the City or of other governmental entities may be required to provide safe and sick time pursuant to the ESSTA. The ESSTA is enforced by the City's Department of Consumer and Worker Protection ("DCWP"), which has promulgated 6 RCNY §§ 7-101 and 201 *et seq*. ("DCWP Rules").

2. The Contractor agrees to comply in all respects with the ESSTA and the DCWP Rules, and as amended, if applicable, in the performance of this agreement. The Contractor further acknowledges that such compliance is a material term of this agreement and that failure to comply with the ESSTA in performance of this agreement may result in its termination.

3. The Contractor must notify (with a copy to DCWP at ComplianceMonitoring@dcwp.nyc.gov) the Agency Chief Contracting Officer of the City Agency or other entity with whom it is contracting in writing within 10 days of receipt of a complaint (whether oral or written) or notice of investigation regarding the ESSTA involving the performance of this agreement. Additionally, the Contractor must cooperate with DCWP's guidance and must comply with DCWP's subpoenas, requests for information, and other document demands as set forth in the ESSTA and the DCWP Rules. More information is available at https://www1.nyc.gov/site/dca/about/paid-sick-leave-what-employers-need-to-know.page.

4. Upon conclusion of a DCWP investigation, Contractor will receive a findings letter detailing any employee relief and civil penalties owed. Pursuant to the findings, Contractor will have the opportunity to settle any violations and cure the breach of this agreement caused by failure to comply with the ESSTA either i) without a trial by entering into a consent order or ii) appearing before an impartial judge at the City's administrative tribunal. In addition to and notwithstanding any other rights and remedies available to the City, non-payment of relief and penalties owed pursuant to a consent order or final adjudication within 30 days of such consent order or final adjudication may result in the termination of this agreement without further opportunity to settle or cure the violations.

5. The ESSTA is briefly summarized below for the convenience of the Contractor. The Contractor is advised to review the ESSTA and the DCWP Rules in their entirety. The Contractor may go to www.nyc.gov/PaidSickLeave for resources for employers, such as Frequently Asked Questions, timekeeping tools and model forms, and an event calendar of upcoming presentations and webinars at which the Contractor can get more information about how to comply with the ESSTA and the DCWP Rules. The Contractor acknowledges that it is responsible for compliance with the ESSTA and the DCWP Rules notwithstanding any inconsistent language contained herein.

B. *Pursuant to the ESSTA and DCWP Rules: Applicability, Accrual, and Use.*

1. An employee who works within the City must be provided paid safe and sick time.[1] Employers with one hundred or more employees are required to provide 56 hours of safe and sick time for an employee each calendar year. Employers with fewer than one hundred employees are required to provide 40 hours of sick leave each calendar year. Employers must provide a minimum of one hour of safe and sick time for every 30 hours worked by an employee and compensation for such safe and sick time must be provided at the greater of the employee's regular hourly rate or the minimum wage at the time the paid safe or sick time is taken. Employers are not discouraged or prohibited from providing more generous safe and sick time policies than what the ESSTA requires.

2. Employees have the right to determine how much safe and sick time they will use, provided that an employer may set a reasonable minimum increment for the use of safe and sick time not to exceed four hours per day. For the use of safe time or sick time beyond the set minimum increment, an employer may set fixed periods of up to thirty minutes beyond the minimum increment. In addition, an employee may carry over up to 40 or 56 hours of unused safe and sick time to the following calendar year, provided that no employer is required to carry over unused paid safe and sick time if the employee is paid for such unused safe and sick time and the employer provides the employee with at least the legally required amount of paid safe and sick time for such employee for the immediately subsequent calendar year on the first day of such calendar year.

3. An employee entitled to safe and sick time pursuant to the ESSTA may use safe and sick time for any of the following:

a. such employee's mental illness, physical illness, injury, or health condition or the care of such illness, injury, or condition or such employee's need for medical diagnosis or preventive medical care;

b. such employee's care of a family member (an employee's child, spouse, domestic partner, parent, sibling, grandchild, or grandparent, the child or parent of an employee's spouse or domestic partner, any other individual related by blood to the employee, and any other individual whose close association with the employee is the equivalent of a family relationship) who has a mental illness, physical illness, injury or health condition or who has a need for medical diagnosis or preventive medical care;

---

[1] Pursuant to the ESSTA, if fewer than five employees work for the same employer, and the employer had a net income of less than one million dollars during the previous tax year, such employer has the option of providing such employees uncompensated safe and sick time.

c. closure of such employee's place of business by order of a public official due to a public health emergency;

d. such employee's need to care for a child whose school or childcare provider has been closed due to a public health emergency; or

e. when the employee or a family member has been the victim of a family offense matter, sexual offense, stalking, or human trafficking:

1. to obtain services from a domestic violence shelter, rape crisis center, or other shelter or services program for relief from a family offense matter, sexual offense, stalking, or human trafficking;
2. to participate in safety planning, temporarily or permanently relocate, or take other actions to increase the safety of the employee or employee's family members from future family offense matters, sexual offenses, stalking, or human trafficking;
3. to meet with a civil attorney or other social service provider to obtain information and advice on, and prepare for or participate in any criminal or civil proceeding, including but not limited to, matters related to a family offense matter, sexual offense, stalking, human trafficking, custody, visitation, matrimonial issues, orders of protection, immigration, housing, discrimination in employment, housing or consumer credit;
4. to file a complaint or domestic incident report with law enforcement;
5. to meet with a district attorney's office;
6. to enroll children in a new school; or
7. to take other actions necessary to maintain, improve, or restore the physical, psychological, or economic, health or safety of the employee or the employee's family member or to protect those who associate or work with the employee.

4. An employer must not require an employee, as a condition of taking safe and sick time, to search for a replacement. However, where the employee's need for safe and sick time is foreseeable, an employer may require an employee to provide reasonable notice of the need to use safe and sick time. For an absence of more than three consecutive work days, an employer may require reasonable documentation that the use of safe and sick time was needed for a reason listed in Admin. Code § 20-914; and/or written confirmation that an employee used safe and sick time pursuant to the ESSTA. However, an employer may not require documentation specifying the nature of a medical condition, require disclosure of the details of a medical condition, or require disclosure of the details of a family offense matter, sexual offense, stalking, or human trafficking, as a condition of providing safe and sick time. Health information and information concerning family offenses, sexual offenses, stalking or human trafficking obtained solely due to an

employee's use of safe and sick time pursuant to the ESSTA must be treated by the employer as confidential. An employer must reimburse an employee for all reasonable costs or expenses incurred in obtaining such documentation for the employer.

5. An employer must provide to all employees a written policy explaining its method of calculating sick time, policies regarding the use of safe and sick time (including any permissible discretionary conditions on use), and policies regarding carry-over of unused time at the end of the year, among other topics. It must provide the policy to employees using a delivery method that reasonably ensures that employees receive the policy. If such employer has not provided its written policy, it may not deny safe and sick time to an employee because of non-compliance with such a policy.

6. An employer must provide a pay statement or other form of written documentation that informs the employee of the amount of safe/sick time accrued and used during the relevant pay period and the total balance of the employee's accrued safe/sick time available for use.

7. Safe and sick time to which an employee is entitled must be paid no later than the payday for the next regular payroll period beginning after the safe and sick time was used.

C. *Exemptions and Exceptions*. Notwithstanding the above, the ESSTA does not apply to any of the following:

1. an independent contractor who does not meet the definition of employee under N.Y. Labor Law § 190(2);

2. an employee covered by a valid collective bargaining agreement, if the provisions of the ESSTA are expressly waived in such agreement and such agreement provides a benefit comparable to that provided by the ESSTA for such employee;

3. an audiologist, occupational therapist, physical therapist, or speech language pathologist who is licensed by the New York State Department of Education and who calls in for work assignments at will, determines their own schedule, has the ability to reject or accept any assignment referred to them, and is paid an average hourly wage that is at least four times the federal minimum wage;

4. an employee in a work study program under Section 2753 of Chapter 42 of the United States Code;

5. an employee whose work is compensated by a qualified scholarship program as that term is defined in the Internal Revenue Code, Section 117 of Chapter 20 of the United States Code; or

6. a participant in a Work Experience Program (WEP) under N.Y. Social Services Law § 336-c.

D. *Retaliation Prohibited.* An employer shall not take any adverse action against an employee that penalizes the employee for, or is reasonably likely to deter the employee from or interfere with the employee exercising or attempting in good faith to exercise any right provided by the ESSTA. In addition, an employer shall not interfere with any investigation, proceeding, or hearing pursuant to the ESSTA.

E. *Notice of Rights.*

1. An employer must provide its employees with written notice of their rights pursuant to the ESSTA. Such notice must be in English and the primary language spoken by an employee, provided that DCWP has made available a translation into such language. Downloadable notices are available on DCWP's website at https://www1.nyc.gov/site/dca/about/Paid-Safe-Sick-Leave-Notice-of-Employee-Rights.page. The notice must be provided to the employees by a method that reasonably ensures personal receipt by the employee.

2. Any person or entity that willfully violates these notice requirements is subject to a civil penalty in an amount not to exceed $50.00 for each employee who was not given appropriate notice.

F. *Records*. An employer must retain records documenting its compliance with the ESSTA for a period of at least three years, and must allow DCWP to access such records in furtherance of an investigation related to an alleged violation of the ESSTA.

G. *Enforcement and Penalties.*

1. Upon receiving a complaint alleging a violation of the ESSTA, DCWP must investigate such complaint. DCWP may also open an investigation to determine compliance with the ESSTA on its own initiative. Upon notification of a complaint or an investigation by DCWP, the employer must provide DCWP with a written response and any such other information as DCWP may request. If DCWP believes that a violation of the ESSTA has occurred, it has the right to issue a notice of violation to the employer .

2. DCWP has the power to grant an employee or former employee all appropriate relief as set forth in Admin. Code § 20-924(d). Such relief may include, but is not limited to, treble damages for the wages that should have been paid; statutory damages for unlawful retaliation; and damages, including statutory damages, full compensation for wages and benefits lost, and reinstatement, for unlawful discharge. In addition, DCWP may impose on an employer found to have violated the ESSTA civil penalties not to exceed $500.00 for a first violation, $750.00 for a second violation within two years of the first violation, and $1,000.00 for each succeeding violation within two years of the previous violation. When an employer has a policy or practice of not providing or refusing to allow the use of safe and sick time to its employees, DCWP may seek penalties and relief on a per employee basis.

3. Pursuant to Admin. Code § 20-924.2, (a) where reasonable cause exists to believe that an employer is engaged in a pattern or practice of violations of the ESSTA, the Corporation Counsel may commence a civil action on behalf of the City in a court of competent jurisdiction by filing a complaint setting forth facts relating to such pattern or practice and requesting relief, which may include injunctive relief, civil penalties and any other appropriate relief. Nothing in § 20-924.2 prohibits DCWP from exercising its authority under section 20-924 or the Charter, provided that a civil action pursuant to § 20-924.2 shall not have previously been commenced.

H. *More Generous Polices and Other Legal Requirements.* Nothing in the ESSTA is intended to discourage, prohibit, diminish, or impair the adoption or retention of a more generous safe and sick time policy, or the obligation of an employer to comply with any contract, collective bargaining agreement, employment benefit plan or other agreement providing more generous safe and sick time. The ESSTA provides minimum requirements pertaining to safe and sick time and does not preempt, limit, or otherwise affect the applicability of any other law, regulation, rule, requirement, policy or standard that provides for greater accrual or use by employees of safe and sick leave or time, whether paid or unpaid, or that extends other protections to employees. The ESSTA may not be construed as creating or imposing any requirement in conflict with any federal or state law, rule or regulation.

New York City Mayoral Executive Order No. 39 Rider

City Fleet and Truck Safety Requirements for City Contractors

Version: 11/19/24

Section 1.01 Background

This rider is included in the Agreement and made a part thereof pursuant to the provisions of Mayoral Executive Order 39 of 2024.

Section 1.02 Definitions

A. Capitalized terms not otherwise defined in this rider shall have the meaning ascribed to them in the Agreement.

B. Agreement: The agreement between the City and the Contractor, to which this rider has been added and made a part.

C. City-contracted Vehicle means a Truck (as hereinafter defined) or any other motor vehicle that the Contractor anticipates providing in accordance with this Agreement or using in performing its obligations under this Agreement on a weekly or more frequent basis[1]. This includes those vehicles anticipated to be provided or used by subcontractors to fulfill the scope of a subcontract for work to be performed under a contract that is subject to the Executive Order, regardless of monetary value of the subcontract, if the vehicle is utilized on a weekly or more frequent basis.

D. Contracting Agency: the City agency or office through which the City of New York has entered into this Agreement.

---

[1] The following vehicles are not considered City-contracted vehicles and are thus not subject to Executive Order 39: any motor vehicle or truck that is utilized pursuant to (1) contracts registered prior to July 1, 2024, including the renewal, extension, or modification of such contracts; (2) an agency on-call emergency contract; (3) an emergency procurement made pursuant to section 3-06 of title 9 of the Rules of the City of New York or pursuant to an executive order of the Mayor or Governor issued under section 24 or section 29-A of the New York State Executive Law; (4) intergovernmental contracts; (5) government-to-government contracts between the City and any State or Federal government agency; and (6) a contract for utilities, as identified in subdivision (b) of section 825 of the New York City Charter.

E. Contractor: the entity providing services under this Agreement.

F. Executive Order: Mayoral Executive Order 39 of 2024, as it may be amended.

G. High Vision Truck: A Truck with a cab-over or cab-forward design wherein the driver sits in front of the front axle as opposed to conventional cab design wherein the engine and front axle are in front of the driver. The distance from the forward of the center of the vehicle bumper at which the driver can see the top of a 3-foot cone shall not exceed eight feet and the distance beyond the exterior of the passenger side door at which the driver can first see the top of the 4-foot cone shall not exceed six feet.

H. Registration: Registration of this Agreement pursuant to Section 328 of the New York City Charter.

I. Telematics: Automatic vehicle location systems that track vehicle location and speed and alert the driver and another designated person(s) to such location and speed in real time.

J. Truck: A City-contracted Vehicle with a manufacturer's gross vehicle weight rating exceeding 10,000 pounds. The term does not include off-road construction vehicles.

K. Truck Surround Cameras: A system of cameras, sensors, and alerts placed on a Truck that provides a Truck operator with a full view of all four sides of the Truck.

L. Vehicle Safety Plan: A plan with regard to City-contracted Vehicles, approved by the Contracting Agency, that includes the components listed in Section 2.03(A) through (F) of this rider.

Section 2.01 Vehicle Requirements

All City-contracted Vehicles shall conform to the following requirements:

A. Truck Surround Cameras: All Trucks, other than High Vision Trucks, shall be outfitted with truck surround cameras in accordance with the following schedule:
   a. Contracts involving 10 or fewer Trucks: No later than 12 months from Registration.
   b. Contracts involving more than 10 Trucks: No later than 18 months from Registration.
   c. New or replacement Truck acquired after work under this Agreement has begun: Truck must be outfitted with Truck Surround Cameras within 12 months from the date of first using such Truck.
   d. Contractor must submit to the Contracting Agency photographic and purchase order evidence, that is satisfactory to the Contracting Agency, of compliance with this Paragraph (A).

B. Truck Side-guards: Contractor shall provide side-guards for City-contracted Vehicles as applicable pursuant to Section 6-141 of the New York City Administrative Code.

C. Telematics: All City-contracted Vehicles must be installed with Telematics. Data gathered by Telematics must be made available in a manner that is satisfactory to the Contracting Agency.

Section 2.02 Safety Requirements

Contractor shall provide the following:

A. Licensing: Contractors shall ensure proper licensing for all drivers who operate City-contracted Vehicles. Contractors shall ensure that all drivers operating City-contracted Vehicles are enrolled in the New York State License Notification System (LENS) and that all out-of-state licenses are being monitored by Contractor. Contractor must notify the Contracting Agency of any license suspensions and/or arrests tied to unsafe or illegal vehicle operation by any drivers of City-contracted Vehicles.

B. Training: Contractor must provide the Contracting Agency documentation, satisfactory to the Contracting Agency, showing:
    a. That all drivers of City-contracted Vehicles have taken a New York State approved defensive driving class within six months after Registration; or
    b. That all drivers of City-contracted Vehicles have attended a New York State-approved defensive driving class within 3 years prior to Registration; or
    c. That all drivers of City-contracted Vehicles have received alternative safe driver training acceptable to the Contracting Agency that is documented to the satisfaction of the Contracting agency.

C. Crash tracking: Contractors must notify the Contracting Agency of any and all collisions that take place involving City-contracted Vehicles while performing services under this Agreement.

Section 2.03 Vehicle Safety Plan

Within one month after Registration, the Contractor must submit, for review and approval, to Contracting Agency, at the address set forth in the Agreement for notices to the City, and DCAS Fleet (C/O Chief Fleet Management Officer, 23rd Floor South, Municipal Building, 1 Centre Street, NY, NY 10007) a proposed vehicle safety plan that shall include at the minimum the components listed in Paragraphs (A) through (E) below. If directed by the Contracting Agency,

Contractor shall revise said proposed vehicle safety plan in accordance with the directions of the Contracting Agency, and until the Contracting Agency issues its approval thereof, Contractor shall submit a revised proposed vehicle safety plan to the Contracting Agency in each case, within 15 days after receipt by Contractor of directions to that effect from the Contracting Agency. Upon approval of the proposed vehicle safety plan, said proposed plan shall be considered the Vehicle Safety Plan and Contractor shall comply with the terms thereof. Each second anniversary of the approval of the Vehicle Safety Plan the Contractor shall submit an update thereof. The Vehicle Safety Plan shall include at the minimum the following components:

A. Vehicle List: List of City-contracted Vehicles, including the year, make, model, VIN and license plate number of each City-contracted Vehicle;

B. Safety Training: Documentation showing that all drivers of City-contracted Vehicles have completed the training detailed in section 2.02(B) of this Rider;

C. Technology: A list of all relevant technology investments installed on City-contracted vehicles, including but not limited to the technology listed in section 2.01 of this Rider;

D. Crash Tracking: An explanation of Contractor's process of monitoring and reviewing collisions including plans to notify Contracting Agency of collisions that take place while performing services under this Agreement;

E. Corrective Action: A corrective action program for drivers of City-contracted Vehicles that engage in unsafe or dangerous driving behaviors and license monitoring; and

F. Additional Safety Measures: Contractor must indicate if there are any additional safety technologies, safety practices, training, or other procedures that are utilized for City-contracted Vehicles during the term of this Agreement.

Section 3.01 Liquidated Damages

A. Contractor acknowledges that its failure to comply with the provisions of this Vehicle Safety Plan will cause loss and damage to the City, the precise extent of which is difficult to ascertain in monetary terms. For this reason, the parties desire to provide fair and reasonable compensation to the City for such losses, which compensation shall not be construed as a penalty. It is therefore agreed that, in addition to any other liquidated damages that the Contractor shall be required to pay to the City in accordance with the provisions of the Agreement, Contractor shall pay to the City the following:
    a. The sum of $500.00 for each instance of a failure by the Contractor to submit a Vehicle Safety Plan in accordance with the provisions of Section 2.03.

b. The sum of $500.00 for each instance of a failure by the Contractor to comply with the provisions of Section 2.02(A) [Licensing].
c. The sum of $500.00 for each instance of a failure by the Contractor to comply with the provisions of Section 2.02(B) [Training].
d. The sum of $500.00 for each instance of a failure by the Contractor to comply with the provisions of Section 2.02(C) [Crash Tracking].
e. The sum of $500.00 for each instance of a failure by the Contractor to comply with the provisions of Section 2.01(C) [Telematics].
f. The sum of $3,000 for each instance of a failure by the Contractor to comply with the provisions of Section 2.01(A).
g. The Contracting Agency will provide at least 5 working days of notice to the Contractor and opportunity to rectify before implementing these liquidated damages.

B. Liquidated damages received pursuant to this Agreement are not intended to be nor shall they be treated as either a partial or full waiver or discharge of the City's right to indemnification, or the Contractor's obligation to indemnify the City, or to any other remedy provided for in this Agreement or by Law. The City may deduct and retain out of the monies which may become due under this Agreement, the amount of any such liquidated damages; and in case the amount which may become due hereunder shall be less than the amount of liquidated damages suffered by the City, the Contractor shall be liable to pay the difference.

CITY OF NEW YORK

STANDARD CONSTRUCTION CONTRACT

March 2017

(NO TEXT ON THIS PAGE)

CITY OF NEW YORK STANDARD CONSTRUCTION CONTRACT

TABLE OF CONTENTS

(NO TEXT ON THIS PAGE) 6
CHAPTER I: THE CONTRACT AND DEFINITIONS 7
ARTICLE 1. THE CONTRACT 7
ARTICLE 2. DEFINITIONS 7
CHAPTER II: THE WORK AND ITS PERFORMANCE 10
ARTICLE 3. CHARACTER OF THE WORK 10
ARTICLE 4. MEANS AND METHODS OF CONSTRUCTION 10
ARTICLE 5. COMPLIANCE WITH LAWS 11
ARTICLE 6. INSPECTION 16
ARTICLE 7. PROTECTION OF WORK AND OF PERSONS AND PROPERTY; NOTICESAND INDEMNIFICATION 17
CHAPTER III: TIME PROVISIONS 18
ARTICLE 8. COMMENCEMENT AND PROSECUTION OF THE WORK 18
ARTICLE 9. PROGRESS SCHEDULES 18
ARTICLE 10. REQUESTS FOR INFORMATION OR APPROVAL 19
ARTICLE 11. NOTICE OF CONDITIONS CAUSING DELAY AND DOCUMENTATION OF DAMAGES CAUSED BY DELAY 19
ARTICLE 12. COORDINATION WITH OTHER CONTRACTORS 23
ARTICLE 13. EXTENSION OF TIME FOR PERFORMANCE 24
ARTICLE 14. COMPLETION AND FINAL ACCEPTANCE OF THE WORK 27
ARTICLE 15. LIQUIDATED DAMAGES 28
ARTICLE 16. OCCUPATION OR USE PRIOR TO COMPLETION 29
CHAPTER IV: SUBCONTRACTS AND ASSIGNMENTS 29
ARTICLE 17. SUBCONTRACTS 29
ARTICLE 18. ASSIGNMENTS 31
CHAPTER V: CONTRACTOR'S SECURITY AND GUARANTEE 32
ARTICLE 19. SECURITY DEPOSIT 32
ARTICLE 20. PAYMENT GUARANTEE 32
ARTICLE 21. RETAINED PERCENTAGE 35
ARTICLE 22. INSURANCE 35
ARTICLE 23. MONEY RETAINED AGAINST CLAIMS 41
ARTICLE 24. MAINTENANCE AND GUARANTY 42
CHAPTER VI: CHANGES, EXTRA WORK, AND DOCUMENTATION OF CLAIM 43
ARTICLE 25. CHANGES 43
ARTICLE 26. METHODS OF PAYMENT FOR OVERRUNS AND EXTRA WORK 43
ARTICLE 27. RESOLUTION OF DISPUTES 46
ARTICLE 28. RECORD KEEPING FOR EXTRA OR DISPUTED WORK OR WORK ON ATIME & MATERIALS BASIS 50
ARTICLE 29. OMITTED WORK 51
ARTICLE 30. NOTICE AND DOCUMENTATION OF COSTS AND DAMAGES;PRODUCTION OF FINANCIAL RECORDS 51
CHAPTER VII: POWERS OF THE RESIDENT ENGINEER, THE ENGINEER ORARCHITECT

AND THE COMMISSIONER 52
ARTICLE 31. THE RESIDENT ENGINEER 52
ARTICLE 32. THE ENGINEER OR ARCHITECT OR PROJECT MANAGER 53
ARTICLE 33. THE COMMISSIONER 53
ARTICLE 34. NO ESTOPPEL 54
CHAPTER VIII: LABOR PROVISIONS 54
ARTICLE 35. EMPLOYEES 54
ARTICLE 36. NO DISCRIMINATION 61
ARTICLE 37. LABOR LAW REQUIREMENTS 63
ARTICLE 38. PAYROLL REPORTS 68
ARTICLE 39. DUST HAZARDS 69
CHAPTER IX: PARTIAL AND FINAL PAYMENTS 69
ARTICLE 40. CONTRACT PRICE 69
ARTICLE 41. BID BREAKDOWN ON LUMP SUM 69
ARTICLE 42. PARTIAL PAYMENTS 70
ARTICLE 43. PROMPT PAYMENT 70
ARTICLE 44. SUBSTANTIAL COMPLETION PAYMENT 71
ARTICLE 45. FINAL PAYMENT 72
ARTICLE 46. ACCEPTANCE OF FINAL PAYMENT 73
ARTICLE 47. APPROVAL BY PUBLIC DESIGN COMMISSION 73
CHAPTER X: CONTRACTOR'S DEFAULT 74
ARTICLE 48. COMMISSIONER'S RIGHT TO DECLARE CONTRACTOR IN DEFAULT 74
ARTICLE 49. EXERCISE OF THE RIGHT TO DECLARE DEFAULT 75
ARTICLE 50. QUITTING THE SITE 75
ARTICLE 51. COMPLETION OF THE WORK 75
ARTICLE 52. PARTIAL DEFAULT 76
ARTICLE 53. PERFORMANCE OF UNCOMPLETED WORK 76
ARTICLE 54. OTHER REMEDIES 76
CHAPTER XI: MISCELLANEOUS PROVISIONS 77
ARTICLE 55. CONTRACTOR'S WARRANTIES 77
ARTICLE 56. CLAIMS AND ACTIONS THEREON 77
ARTICLE 57. INFRINGEMENT 78
ARTICLE 58. NO CLAIM AGAINST OFFICIALS, AGENTS OR EMPLOYEES 78
ARTICLE 59. SERVICE OF NOTICES 78
ARTICLE 60. UNLAWFUL PROVISIONS DEEMED STRICKEN FROM CONTRACT 78
ARTICLE 61. ALL LEGAL PROVISIONS DEEMED INCLUDED 79
ARTICLE 62. TAX EXEMPTION 79
ARTICLE 63. INVESTIGATION(S) CLAUSE 80
ARTICLE 64. TERMINATION BY THE CITY 82
ARTICLE 65. CHOICE OF LAW, CONSENT TO JURISDICTION AND VENUE 85
ARTICLE 66. PARTICIPATION IN AN INTERNATIONAL BOYCOTT 85
ARTICLE 67. LOCALLY BASED ENTERPRISE PROGRAM 86
ARTICLE 68. ANTITRUST 87
ARTICLE 69. MacBRIDE PRINCIPLES PROVISIONS 87
ARTICLE 70. ELECTRONIC FILING/NYC DEVELOPMENT HUB 89
ARTICLE 71. PROHIBITION OF TROPICAL HARDWOODS 89
ARTICLE 72. CONFLICTS OF INTEREST 89

ARTICLE 73. MERGER CLAUSE **89**
ARTICLE 74. STATEMENT OF WORK **89**
ARTICLE 75. COMPENSATION TO BE PAID TO CONTRACTOR **90**
ARTICLE 76. ELECTRONIC FUNDS TRANSFER **90**
ARTICLE 77. RECORDS RETENTION **90**
ARTICLE 78. EXAMINATION AND VIEWING OF SITE, CONSIDERATION OF OTHER SOURCES OF INFORMATION AND CHANGED SITE CONDITIONS **90**
ARTICLE 79. PARTICIPATION BY MINORITY-OWNED AND WOMEN-OWNED BUSINESS ENTERPRISES IN CITY PROCUREMENT **91**
PERFORMANCE BOND #1 ..... **99**
PERFORMANCE BOND #2 ..... **103**
PAYMENT BOND **107**

(NO TEXT ON THIS PAGE)

WITNESSETH:

The parties, in consideration of the mutual agreements contained herein, agree as follows:

CHAPTER I: THE CONTRACT AND DEFINITIONS

ARTICLE 1. THE CONTRACT

1.1 Except for titles, subtitles, headings, running headlines, tables of contents and indices (all of which are printed herein merely for convenience), the following, except for such portions thereof as maybe specifically excluded, shall be deemed to be part of this **Contract**:

1.1.1 All provisions required by law to be inserted in this **Contract**, whether actuallyinserted or not;

1.1.2 The Contract Drawings and Specifications;

1.1.3 The General Conditions and Special Conditions, if any;

1.1.4 The **Contract**;

1.1.5 The Information for Bidders; Request for Proposals; Notice of Solicitation andProposal For Bids; Bid or Proposal, and, if used, the Bid Booklet;

1.1.6 All Addenda issued prior to the receipt of the bids; the Notice of Award; Performance and Payment Bonds, if required; and the Notice to Proceed or the Order to Work.

1.2 Should any conflict occur in or between the Drawings and Specifications, the **Contractor** shall be deemed to have estimated the most expensive way of doing the **Work**, unless the **Contractor** shall have asked for and obtained a decision in writing from the **Commissioner** of the **Agency** that is entering into this **Contract**, before the submission of its bid, as to what shall govern.

ARTICLE 2. DEFINITIONS

2.1 The following words and expressions, or pronouns used in their stead, shall, wherever they appear in this Contract, be construed as follows, unless a different meaning is clear from the context:

2.1.1 **"Addendum"** or **"Addenda"** shall mean the additional Contract provisions and/or technical clarifications issued in writing by the Commissioner prior to the receipt of bids.

2.1.2 **"Agency"** shall mean a city, county, borough or other office, position, department, division, bureau, board or commission, or a corporation, institution or agency of government, the expenses of which are paid in whole or in part from the City treasury.

2.1.3 **"Agency Chief Contracting Officer" (ACCO)** shall mean a person delegated authority by the Commissioner to organize and supervise the procurement activity of subordinate Agency staff in conjunction with the CCPO, or his/her duly authorized representative.

2.1.4 **"Allowance"** shall mean a sum of money which the Agency may include in the total amount of the Contract for such specific contingencies as the Agency believes may be necessary to complete the Work, *e.g.*, lead or asbestos remediation, and for which the Contractor will be paid on the basis of stipulated unit prices or a formula set forth in the Contract or negotiated between the parties provided, however, that if the Contractor is not directed to use the Allowance, the Contractor shall have no right to such money and it shall be deducted from the total amount of the Contract.

2.1.5 **"City"** shall mean the City of New York.

2.1.6 **"City Chief Procurement Officer" (CCPO)** shall mean a person delegated authority by the Mayor to coordinate and oversee the procurement activity of Mayoral agency staff, including the ACCO and any offices which have oversight responsibility for the procurement of construction, or his/her duly authorized representative.

2.1.7 **"Commissioner"** shall mean the head of the Agency that has entered into this Contract, or his/her duly authorized representative.

2.1.8 **"Comptroller"** shall mean the Comptroller of the City of New York.

2.1.9 **"Contract"** or **"Contract Documents"** shall mean each of the various parts of the contract referred to in Article 1 hereof, both as a whole and severally.

2.1.10 **"Contract Drawings"** shall mean only those drawings specifically entitled as such and listed in the Specifications or in any Addendum, or any drawings furnished by the Commissioner, pertaining or supplemental thereto.

2.1.11 **"Contract Work"** shall mean everything required to be furnished and done by the Contractor by any one or more of the parts of the Contract referred to in Article 1, except Extra Work as hereinafter defined.

2.1.12 **"Contractor"** shall mean the entity which executed this Contract, whether a corporation, firm, partnership, joint venture, individual, or any combination thereof, and its, their, his/her successors, personal representatives, executors, administrators, and assigns, and any person, firm, partnership, joint venture, individual, or corporation which shall at any time be substituted in the place of the Contractor under this Contract.

2.1.13 **"Days"** shall mean calendar days, except where otherwise specified.

2.1.14 **"Engineer"** or **"Architect"** or **"Project Manager"** shall mean the person so designated in writing by the Commissioner in the Notice to Proceed or the Order to Work to act as such in relation to this Contract, including a private Architect or Engineer or Project Manager, as the case may be. Subject to written approval by the Commissioner, the Engineer, Architect or Project Manager may designate an authorized representative.

2.1.15 **"Engineering Audit Officer" (EAO)** shall mean the person so designated by the Commissioner to perform responsible auditing functions hereunder.

2.1.16 **"Extra Work"** shall mean Work other than that required by the Contract at the time of award which is authorized by the Commissioner pursuant to Chapter VI of this Contract.

2.1.17 **"Federal-Aid Contract"** shall mean a contract in which the United States (federal) Government provides financial funding as so designated in the Information for Bidders.

2.1.18 **"Final Acceptance"** shall mean final written acceptance of all the Work by the Commissioner, a copy of which shall be sent to the Contractor.

2.1.19 **"Final Approved Punch List"** shall mean a list, approved pursuant to Article 14.2.2, specifying those items of Work to be completed by the Contractor after Substantial Completion and dates for the completion of each item of Work.

2.1.20 **"Law"** or **"Laws"** shall mean the Constitution of the State of New York, the New York City Charter, the New York City Administrative Code, a statute of the United States or of the State of New York, a local law of the City of New York, any ordinance, rule or regulation having the force of law, or common law.

2.1.21 **"Materialman"** shall mean any corporation, firm, partnership, joint venture, or individual, other than employees of the Contractor, who or which contracts with the Contractor or any Subcontractor, to fabricate or deliver, or who actually fabricates or delivers, plant, materials or equipment to be incorporated in the Work.

2.1.22 **"Means and Methods of Construction"** shall mean the labor, materials, temporary structures, tools, plant, and construction equipment, and the manner and time of their use, necessary to accomplish the result intended by this Contract.

2.1.23**"Notice to Proceed" or "Order to Work"** shall mean the written notice issued bythe Commissioner specifying the time for commencement of the Work and the Engineer, Architect or Project Manager.

2.1.24 **"Other Contractor(s)"** shall mean any contractor (other than the entity which executed this Contract or its Subcontractors) who or which has a contract with the City for work on or adjacent to the building or Site of the Work.

2.1.25 **"Payroll Taxes"** shall mean State Unemployment Insurance (SUI), Federal Unemployment Insurance (FUI), and payments pursuant to the Federal Insurance Contributions Act (FICA).

2.1.26 **"Project"** shall mean the public improvement to which this Contract relates.

2.1.27 **"Procurement Policy Board" (PPB)** shall mean the Agency of the City of New York whose function is to establish comprehensive and consistent procurement policies and rules which shall have broad application throughout the City.

2.1.28 **"Required Quantity"** in a unit price Contract shall mean the actual quantity of any item of Work or materials which is required to be performed or furnished in order to comply with the Contract.

2.1.29 **"Resident Engineer"** shall mean the representative of the Commissioner duly designated by the Commissioner to be his/her representative at the site of the Work.

2.1.30 **"Site"** shall mean the area upon or in which the Contractor's operations are carried on, and such other areas adjacent thereto as may be designated as such by the Engineer.

2.1.31 **"Small Tools"** shall mean items that are ordinarily required for a worker's job

function, including but not limited to, equipment that ordinarily has no licensing, insurance or substantive storage costs associated with it; such as circular and chain saws, impactdrills, threaders, benders, wrenches, socket tools, etc.

2.1.32 **"Specifications"** shall mean all of the directions, requirements, and standards of performance applying to the Work as hereinafter detailed and designated under the Specifications.

2.1.33 **"Subcontractor"** shall mean any person, firm or corporation, other than employees of the Contractor, who or which contracts with the Contractor or with its subcontractors to furnish, or actually furnishes labor, or labor and materials, or labor and equipment, or superintendence, supervision and/or management at the Site. Wherever the word Subcontractor appears, it shall also mean sub-Subcontractor.

2.1.34 **"Substantial Completion"** shall mean the written determination by the Engineer that the Work required under this Contract is substantially, but not entirely, complete and the approval of the **Final Approved Punch List**.

2.1.35 **"Work"** shall mean all services required to complete the Project in accordance with the Contract Documents, including without limitation, labor, material, superintendence, management, administration, equipment, and incidentals, and obtaining any and all permits, certifications and licenses as may be necessary and required to complete the Work, and shall include both Contract Work and Extra Work.

CHAPTER II: THE WORK AND ITS PERFORMANCE

ARTICLE 3. CHARACTER OF THE WORK

3.1 Unless otherwise expressly provided in the **Contract Drawings**, **Specifications,** and **Addenda**, the **Work** shall be performed in accordance with the best modern practice, utilizing, unless otherwise specified in writing, new and unused materials of standard first grade quality and workmanship anddesign of the highest quality, to the satisfaction of the **Commissioner**.

ARTICLE 4. MEANS AND METHODS OF CONSTRUCTION

4.1 Unless otherwise expressly provided in the **Contract Drawings**, **Specifications,** and **Addenda**, the **Means and Methods of Construction** shall be such as the **Contractor** may choose; subject, however, to the **Engineer's** right to reject the **Means and Methods of Construction** proposed by the **Contractor** which in the opinion of the **Engineer**:

4.1.1 Will constitute or create a hazard to the **Work**, or to persons or property; or

4.1.2 Will not produce finished **Work** in accordance with the terms of the **Contract**; or

4.1.3 Will be detrimental to the overall progress of the **Project**.

4.2 The **Engineer's** approval of the **Contractor's Means and Methods of Construction**, orhis/her failure to exercise his/her right to reject such means or methods, shall not relieve the **Contractor** of its obligation to complete the **Work** as provided in this **Contract**; nor shall the exercise of such rightto reject

create a cause of action for damages.

ARTICLE 5. COMPLIANCE WITH LAWS

5.1 The **Contractor** shall comply with all **Laws** applicable to this **Contract** and to the **Work** to be done hereunder.

5.2 Procurement Policy Board Rules: This **Contract** is subject to the Rules of the **PPB** ("**PPB** Rules") in effect at the time of the bid opening for this **Contract**. In the event of a conflict between the **PPB** Rules and a provision of this **Contract**, the **PPB** Rules shall take precedence.

5.3 Noise Control Code provisions.

5.3.1 In accordance with the provisions of Section 24-216(b) of the Administrative Code of the **City** ("Administrative Code"), Noise Abatement Contract Compliance, devices and activities which will be operated, conducted, constructed or manufactured pursuant to this **Contract** and which are subject to the provisions of the **City** Noise Control Code shall be operated, conducted, constructed, or manufactured without causing a violation of the Administrative Code. Such devices and activities shall incorporate advances in the art of noise control development for the kind and level of noise emitted or produced by such devices and activities, in accordance with regulations issued by the **Commissioner** of the **City** Department of Environmental Protection.

5.3.2 The **Contractor** agrees to comply with Section 24-219 of the Administrative Code and implementing rules codified at 15 Rules of the City of New York ("RCNY") Section 28-100 *et seq*. In accordance with such provisions, the **Contractor**, if the **Contractor** is the responsible party under such regulations, shall prepare and post a Construction Noise Mitigation Plan at each **Site**, in which the **Contractor** shall certify that all construction tools and equipment have been maintained so that they operate at normal manufacturers operating specifications. If the **Contractor** cannot make this certification, it must have in place an Alternative Noise Mitigation Plan approved by the **City** Department of Environmental Protection. In addition, the **Contractor**'s certified Construction Noise Mitigation Plan is subject inspection by the **City** Department of Environmental Protection in accordance with Section 28-101 of Title 15 of RCNY. No **Contract Work** may take place at a **Site** unless there is a Construction Noise Mitigation Plan or approved Alternative Noise Mitigation Plan in place. In addition, the **Contractor** shall create and implement a noise mitigation training program. Failure to comply with these requirements may result in fines and other penalties pursuant to the applicable provisions of the Administrative Code and RCNY.

5.4 Ultra Low Sulfur Diesel Fuel: In accordance with the provisions of Section 24-163.3 of the Administrative Code, the **Contractor** specifically agrees as follows:

5.4.1 Definitions. For purposes of this Article 5.4, the following definitions apply:

5.4.1(a) "Contractor" means any person or entity that enters into a Public Works Contract with a **City Agency**, or any person or entity that enters into an agreement with such person or entity, to perform work or provide labor or services related to such Public Works Contract.

5.4.1(b) "Motor Vehicle" means any self-propelled vehicle designed for transporting

persons or property on a street or highway.

5.4.1(c) "Nonroad Engine" means an internal combustion engine (including the fuel system) that is not used in a Motor Vehicle or a vehicle used solely for competition,or that is not subject to standards promulgated under Section 7411 or Section 7521 of Title 42 of the United States Code, except that this term shall apply to internal combustion engines used to power generators, compressors or similar equipment used in any construction program or project.

5.4.1(d) "Nonroad Vehicle" means a vehicle that is powered by a Nonroad Engine, fifty (50) horsepower and greater, and that is not a Motor Vehicle or a vehicle used solely for competition, which shall include, but not be limited to, excavators, backhoes, cranes, compressors, generators, bulldozers, and similar equipment, except that this term shall not apply to horticultural maintenance vehicles used for landscaping purposes that are powered by a Nonroad Engine of sixty-five (65) horsepower or less and that are not used in any construction program or project.

5.4.1(e) "Public Works Contract" means a contract with a **City Agency** for a construction program or project involving the construction, demolition, restoration, rehabilitation, repair, renovation, or abatement of any building, structure, tunnel, excavation, roadway, park or bridge; a contract with a **City Agency** for the preparation for any construction program or project involving the construction, demolition, restoration, rehabilitation, repair, renovation, or abatement of any building, structure, tunnel, excavation, roadway, park or bridge; or a contract with a **City Agency** for any final work involved in the completion of any construction program or project involving the construction, demolition, restoration, rehabilitation, repair, renovation, or abatement of any building, structure, tunnel, excavation, roadway, park or bridge.

5.4.1(f) "Ultra Low Sulfur Diesel Fuel" means diesel fuel that has a sulfur content of no more than fifteen parts per million (15 ppm).

5.4.2 Ultra Low Sulfur Diesel Fuel

5.4.2(a) All **Contractors** shall use Ultra Low Sulfur Diesel Fuel in diesel-powered Nonroad Vehicles in the performance of this **Contract**.

5.4.2(b) Notwithstanding the requirements of Article 5.4.2(a), **Contractors** may use diesel fuel that has a sulfur content of no more than thirty parts per million (30 ppm)to fulfill the requirements of this Article 5.4.2, where the Commissioner of the **City** Department of Environmental Protection ("DEP Commissioner") has issued a determination that a sufficient quantity of Ultra Low Sulfur Diesel Fuel is not available to meet the needs of **Agencies** and **Contractors**. Any such determination shall expire after six (6) months unless renewed.

5.4.2(c) **Contractors** shall not be required to comply with this Article 5.4.2 where the **City Agency** letting this **Contract** makes a written finding, which is approved, in writing, by the DEP Commissioner, that a sufficient quantity of Ultra Low Sulfur Diesel Fuel, or diesel fuel that has a sulfur content of no more than thirty parts per million (30 ppm) is not available to meet the requirements of Section 24-163.3 of the Administrative Code, provided that such **Contractor** in its fulfillment of the requirements of this **Contract**, to the extent practicable, shall use whatever quantity of Ultra Low Sulfur Diesel Fuel or diesel fuel that has a sulfur content of no more than thirty parts per

million (30 ppm) is available. Any finding made pursuant to this Article 5.4.2(c) shall expire after sixty (60) **Days**, at which time the requirements of this Article 5.4.2 shall be in full force and effect unless the **City Agency** renews the finding in writing and such renewal is approved by the DEP Commissioner.

5.4.2(d) **Contractors** may check on determinations and approvals issued by the DEP Commissioner pursuant to Section 24-163.3 of the Administrative Code, if any, at www.dep.nyc.gov or by contacting the **City Agency** letting this **Contract**.

5.4.2(e) The requirements of this Article 5.4.2 do not apply where they are precluded by federal or State funding requirements or where the **Contract** is an emergency procurement.

5.4.3 Best Available Technology

5.4.3(a) All **Contractors** shall utilize the best available technology for reducing the emission of pollutants for diesel-powered Nonroad Vehicles in the performance of this **Contract**. For determinations of best available technology for each type of diesel-powered Nonroad Vehicle, **Contractors** shall comply with the regulations of the **City** Department of Environmental Protection, as and when adopted, Chapter 14 of Title 15 of the Rules of the City of New York (RCNY). The **Contractor** shall fully document all steps in the best available technology selection process and shall furnish such documentation to the **City Agency** or the DEP Commissioner upon request. The **Contractor** shall retain all documentation generated in the best available technology selection process for as long as the selected best available technology is in use.

5.4.3(b) No **Contractor** shall be required to replace best available technology for reducing the emission of pollutants or other authorized technology utilized for a diesel-powered Nonroad Vehicle in accordance with the provisions of this Article 5.4.3 within three (3) years of having first utilized such technology for such vehicle.

5.4.3(c) This Article 5.4.3 shall not apply to any vehicle used to satisfy the requirements of a specific Public Works Contract for fewer than twenty (20) **Days**.

5.4.3(d) The **Contractor** shall not be required to comply with this Article 5.4.3 with respect to a diesel-powered Nonroad Vehicle under the following circumstances:

5.4.3(d)(i) Where the **City Agency** makes a written finding, which is approved, in writing, by the DEP Commissioner, that the best available technology for reducing the emission of pollutants as required by this Article 5.4.3 is unavailable for such vehicle, the **Contractor** shall use whatever technology for reducing the emission of pollutants, if any, is available and appropriate for such vehicle.

5.4.3(d)(ii) Where the DEP Commissioner has issued a written waiver based upon the Contractor having demonstrated to the DEP Commissioner that the use of the best available technology for reducing the emission of pollutants might endanger the operator of such vehicle or those working near such vehicle, due to engine malfunction, the **Contractor** shall use whatever technology for reducing the emission of pollutants, if any, is available and appropriate for such vehicle, which would not endanger the operator of such vehicle or those working near such vehicle.

5.4.3(d)(iii) In determining which technology to use for the purposes of Articles 5.4.3(d)(i) and 5.4.3(d)(ii) above, the **Contractor** shall primarily consider the reduction in emissions of particulate matter and secondarily consider the reduction in emissions of nitrogen oxides associated with the use of such technology, which shall in no event result in an increase in the emissions of either such pollutant.

5.4.3(d)(iv) The **Contractor** shall submit requests for a finding or a waiver pursuant to this Article 5.4.3(d) in writing to the DEP Commissioner, with a copy to the **ACCO** of the **City Agency** letting this **Contract**. Any finding or waiver made or issued pursuant to Articles 5.4.3(d)(i) and 5.4.3(d)(ii) above shall expire after one hundred eighty (180) **Days**, at which time the requirements of Article 5.4.3(a) shall be in full force and effect unless the **City Agency** renews the finding, in writing, and the DEP Commissioner approves such finding, in writing, or the DEP Commissioner renews the waiver, in writing.

5.4.3(e) The requirements of this Article 5.4.3 do not apply where they are precluded by federal or State funding requirements or where the **Contract** is an emergency procurement.

5.4.4 Section 24-163 of the Administrative Code. The **Contractor** shall comply with Section 24-163 of the Administrative Code related to the idling of the engines of motor vehicles while parking.

5.4.5 Compliance

5.4.5(a) The **Contractor's** compliance with Article 5.4 may be independently monitored. If it is determined that the **Contractor** has failed to comply with any provision of Article 5.4, any costs associated with any independent monitoring incurred by the **City** shall be reimbursed by the **Contractor**.

5.4.5(b) Any **Contractor** who violates any provision of Article 5.4, except as provided in Article 5.4.5(c) below, shall be liable for a civil penalty between the amounts of one thousand ($1,000) and ten thousand ($10,000) dollars, in addition to twice the amount of money saved by such **Contractor** for failure to comply with Article 5.4.

5.4.5(c) No **Contractor** shall make a false claim with respect to the provisions of Article 5.4 to a **City Agency**. Where a **Contractor** has been found to have done so, such **Contractor** shall be liable for a civil penalty of twenty thousand ($20,000) dollars, in addition to twice the amount of money saved by such **Contractor** in association with having made such false claim.

5.4.6 Reporting

5.4.6(a) For all Public Works Contracts covered by this Article 5.4, the **Contractor** shall report to the **City Agency** the following information:

5.4.6(a)(i) The total number of diesel-powered Nonroad Vehicles used to fulfill the requirements of this Public Works Contract;

5.4.6(a)(ii) The number of such Nonroad Vehicles that were powered by Ultra Low Sulfur Diesel Fuel;

5.4.6(a)(iii) The number of such Nonroad Vehicles that utilized the best available technology for reducing the emission of pollutants, including a breakdown by vehicle model and the type of technology;

5.4.6(a)(iv) The number of such Nonroad Vehicles that utilized such other authorized technology in accordance with Article 5.4.3, including a breakdown by vehicle model and the type of technology used for each such vehicle;

5.4.6(a)(v) The locations where such Nonroad Vehicles were used; and

5.4.6(a)(vi) Where a determination is in effect pursuant to Article 5.4.2(b) or 5.4.2(c), detailed information concerning the **Contractor's** efforts to obtain Ultra Low Sulfur Diesel Fuel or diesel fuel that has a sulfur content of no more than thirty parts per million (30 ppm).

5.4.6(b) The **Contractor** shall submit the information required by Article 5.4.6(a) at the completion of **Work** under the Public Works Contract and on a yearly basis no later than August 1 throughout the term of the Public Works Contract. The yearly report shall cover **Work** performed during the preceding fiscal year (July 1 - June 30).

5.5 Ultra Low Sulfur Diesel Fuel. In accordance with the Coordinated Construction Act for Lower Manhattan, as amended:

5.5.1 Definitions. For purposes of this Article 5.5, the following definitions apply:

5.5.1(a) "Lower Manhattan" means the area to the south of and within the following lines: a line beginning at a point where the United States pierhead line in the Hudson River as it exists now or may be extended would intersect with the southerly line of West Houston Street in the Borough of Manhattan extended, thence easterly along the southerly side of West Houston Street to the southerly side of Houston Street, thence easterly along the southerly side of Houston Street to the southerly side of East Houston Street, thence northeasterly along the southerly side of East Houston Street to the point where it would intersect with the United States pierhead line in the East River as it exists now or may be extended, including tax lots within or immediately adjacent thereto.

5.5.1(b) "Lower Manhattan Redevelopment Project" means any project in Lower Manhattan that is funded in whole or in part with federal or State funding, or any project intended to improve transportation between Lower Manhattan and the two air terminals in the **City** known as LaGuardia Airport and John F. Kennedy International Airport, or between Lower Manhattan and the air terminal in Newark known as Newark Liberty International Airport, and that is funded in whole or in part with federal funding.

5.5.1(c) "Nonroad Engine" means an internal combustion engine (including the fuel system) that is not used in a Motor Vehicle or a vehicle used solely for competition, or that is not subject to standards promulgated under Section 7411 or Section 7521 of Title 42 of the United States Code, except that this term shall apply to internal combustion engines used to power generators, compressors or similar equipment used in any construction program or project.

5.5.1(d) "Nonroad Vehicle" means a vehicle that is powered by a Nonroad Engine, fifty (50) horsepower (HP) and greater, and that is not a Motor Vehicle or a vehicle used

solely for competition, which shall include, but not be limited to, excavators, backhoes, cranes, compressors, generators, bulldozers, and similar equipment, except that this terms shall not apply to horticultural maintenance vehicles used for landscaping purposes that are powered by a Nonroad Engine of sixty-five (65) HP or less and that are not used in any construction program or project.

5.5.1(e) "Ultra Low Sulfur Diesel Fuel" means diesel fuel that has a sulfur content of no more than fifteen parts per million (15 ppm).

5.5.2 Requirements. **Contractors** and **Subcontractors** are required to use only Ultra Low Sulfur Diesel Fuel to power the diesel-powered Nonroad Vehicles with engine HP rating of fifty (50) HP and above used on a Lower Manhattan Redevelopment Project and, where practicable, to reduce the emission of pollutants by retrofitting such Nonroad Vehicles with oxidation catalysts, particulate filters, or technology that achieves lowest particulate matter emissions.

5.6 Pesticides. In accordance with Section 17-1209 of the Administrative Code, to the extent that the **Contractor** or any **Subcontractor** applies pesticides to any property owned or leased by the **City**, the **Contractor,** and any **Subcontractor** shall comply with Chapter 12 of the Administrative Code.

5.7 Waste Treatment, Storage, and Disposal Facilities and Transporters. In connection withthe **Work**, the **Contractor** and any **Subcontractor** shall use only those waste treatment, storage, and disposal facilities and waste transporters that possess the requisite license, permit or other governmental approval necessary to treat, store, dispose, or transport the waste, materials or hazardous substances.

5.8 Environmentally Preferable Purchasing. The **Contractor** shall ensure that products purchased or leased by the **Contractor** or any **Subcontractor** for the **Work** that are not specified by the **City** or are submitted as equivalents to a product specified by the **City** comply with the requirements of the New York City Environmentally Preferable Purchasing Program contained in Chapter 11 of Title 43 of the RCNY, pursuant to Chapter 3 of Title 6 of the Administrative Code.

ARTICLE 6. INSPECTION

6.1 During the progress of the **Work** and up to the date of **Final Acceptance**, the **Contractor** shall at all times afford the representatives of the **City** every reasonable, safe, and proper facility for inspecting all **Work** done or being done at the **Site** and also for inspecting the manufacture or preparation of materials and equipment at the place of such manufacture or preparation.

6.2 The **Contractor's** obligation hereunder shall include the uncovering or taking down of finished **Work** and its restoration thereafter; provided, however, that the order to uncover, take down and restore shall be in writing, and further provided that if **Work** thus exposed proves satisfactory, and if the **Contractor** has complied with Article 6.1, such uncovering or taking down and restoration shall be considered an item of **Extra Work** to be paid for in accordance with the provisions of Article 26. If the **Work** thus exposed proves unsatisfactory, the **City** has no obligation to compensate the **Contractor** for the uncovering, taking down or restoration.

6.3 Inspection and approval by the **Commissioner**, the **Engineer**, **Project Manager**, or **Resident Engineer**, of finished **Work** or of **Work** being performed, or of materials and equipment at the place of manufacture or preparation, shall not relieve the **Contractor** of its obligation to perform the **Work** in strict accordance with the **Contract**. Finished or unfinished **Work** not found to be in strict accordance with the

Contract shall be replaced as directed by the **Engineer**, even though such **Work** may have been previously approved and paid for. Such corrective **Work** is **Contract Work** and shall not be deemed **Extra Work**.

6.4 Rejected **Work** and materials shall be promptly taken down and removed from the **Site**, which must at all times be kept in a reasonably clean and neat condition.

ARTICLE 7. PROTECTION OF WORK AND OF PERSONS AND PROPERTY; NOTICESAND INDEMNIFICATION

7.1 During the performance of the **Work** and up to the date of **Final Acceptance**, the **Contractor** shall be under an absolute obligation to protect the finished and unfinished **Work** against any damage, loss, injury, theft and/or vandalism and in the event of such damage, loss, injury, theft and/or vandalism,it shall promptly replace and/or repair such **Work** at the **Contractor's** sole cost and expense, as directed by the **Resident Engineer**. The obligation to deliver finished **Work** in strict accordance with the **Contract** prior to **Final Acceptance** shall be absolute and shall not be affected by the **Resident Engineer's** approval of, or failure to prohibit, the **Means and Methods of Construction** used by the **Contractor**.

7.2 During the performance of the **Work** and up to the date of **Final Acceptance**, the **Contractor** shall take all reasonable precautions to protect all persons and the property of the **City** and of others from damage, loss or injury resulting from the **Contractor's**, and/or its **Subcontractors'** operations under this **Contract.** The **Contractor's** obligation to protect shall include the duty to provide, place or replace, and adequately maintain at or about the **Site** suitable and sufficient protection such as lights, barricades, and enclosures.

7.3 The **Contractor** shall comply with the notification requirements set forth below in the event of any loss, damage or injury to **Work**, persons or property, or any accidents arising out of the operations of the **Contractor** and/or its **Subcontractors** under this **Contract**.

7.3.1 The **Contractor** shall make a full and complete report in writing to the **Resident Engineer** within three (3) **Days** after the occurrence.

7.3.2 The **Contractor** shall also send written notice of any such event to all insurance carriers that issued potentially responsive policies (including commercial general liability insurance carriers for events relating to the **Contractor**'s own employees) no later than twenty (20) days after such event and again no later than twenty (20) days after the initiation of any claim and/or action resulting therefrom. Such notice shall contain the following information: the number of the insurance policy, the name of the Named Insured, the date and location of the incident, and the identity of the persons injured or property damaged. For any policy on which the **City** and/or the **Engineer**, **Architect**, or **Project Manager** are Additional Insureds, such notice shall expressly specify that "this notice is being given on behalf of the City of New York as Additional Insured, such other AdditionalInsureds, as well as the Named Insured."

7.3.2(a) Whenever such notice is sent under a policy on which the **City** is an Additional Insured, the **Contractor** shall provide copies of the notice to the **Comptroller,** the **Commissioner** and the **City** Corporation Counsel. The copy to the **Comptroller** shall be sent to the Insurance Unit, NYC Comptroller's Office, 1 Centre Street – Room 1222, New York, New York, 10007. The copy to the **Commissioner** shall be sent to the address set forth in Schedule A of the General Conditions. The copy to the **City** Corporation Counsel shall be sent to Insurance Claims Specialist, Affirmative Litigation

Division, New York City Law Department, 100 Church Street, New York, New York 10007.

7.3.2(b) If the **Contractor** fails to provide any of the foregoing notices to anyappropriate insurance carrier(s) in a timely and complete manner, the **Contractor**shall indemnify the **City** for all losses, judgments, settlements, and expenses, including reasonable attorneys' fees, arising from an insurer's disclaimer of coverage citing late notice by or on behalf of the **City**.

7.4 To the fullest extent permitted by law, the **Contractor** shall defend, indemnify, and hold the **City**, its employees, and officials (the "Indemnitees") harmless against any and all claims (including but not limited to claims asserted by any employee of the **Contractor** and/or its **Subcontractors**) and costs and expenses of whatever kind (including but not limited to payment or reimbursement of attorneys' fees and disbursements) allegedly arising out of or in any way related to the operations of the **Contractor** and/or its **Subcontractors** in the performance of this **Contract** or from the **Contractor's** and/or its **Subcontractors'** failure to comply with any of the provisions of this **Contract** or of the **Law**. Such costs and expenses shall include all those incurred in defending the underlying claim and those incurred in connection with the enforcement of this Article 7.4 by way of cross-claim, third-party claim, declaratory action or otherwise. The parties expressly agree that the indemnification obligation hereunder contemplates (1) full indemnity in the event of liability imposed against the Indemnitees without negligence and solely by reason of statute, operation of **Law** or otherwise; and (2) partial indemnity in the event of any actual negligence on the part of the Indemnitees either causing orcontributing to the underlying claim (in which case, indemnification will be limited to any liability imposed over and above that percentage attributable to actual fault whether by statute, by operation of **Law**, or otherwise). Where partial indemnity is provided hereunder, all costs and expenses shall be indemnified on a pro rata basis.

7.4.1 Indemnification under Article 7.4 or any other provision of the **Contract** shall operate whether or not **Contractor** or its **Subcontractors** have placed and maintained the insurance specified under Article 22.

7.5 The provisions of this Article 7 shall not be deemed to create any new right of action in favor of third parties against the **Contractor** or the **City**.

CHAPTER III: TIME PROVISIONS

ARTICLE 8. COMMENCEMENT AND PROSECUTION OF THE WORK

8.1 The **Contractor** shall commence the **Work** on the date specified in the **Notice to Proceed** or the **Order to Work**. The time for performance of the **Work** under the **Contract** shall be computed from the date specified in the **Notice to Proceed** or the **Order to Work**. **TIME BEING OF THE ESSENCE** to the **City**, the **Contractor** shall thereafter prosecute the **Work** diligently, using such **Means and Methods of Construction** as are in accord with Article 4 herein and as will assure its completion not later than the date specified in this Contract, or on the date to which the time for completion may be extended.

ARTICLE 9. PROGRESS SCHEDULES

9.1 To enable the **Work** to be performed in an orderly and expeditious manner, the **Contractor**, within fifteen (15) **Days** after the **Notice to Proceed** or **Order to Work**, unless otherwise directed by the **Engineer**, shall submit to the **Engineer** a proposed progress schedule based on the Critical Path Methodin the form of

a bar graph or in such other form as specified by the **Engineer**, and monthly cash flow requirements, showing:

9.1.1 The anticipated time of commencement and completion of each of the variousoperations to be performed under this **Contract**; and

9.1.2 The sequence and interrelation of each of these operations with the others and with those of other related contracts; and

9.1.3 The estimated time required for fabrication or delivery, or both, of all materials and equipment required for the **Work**, including the anticipated time for obtaining required approvals pursuant to Article 10; and

9.1.4 The estimated amount in dollars the **Contractor** will claim on a monthly basis.

9.2 The proposed schedule shall be revised as directed by the **Engineer**, until finally approved by the **Engineer**, and after such approval, subject to the provisions of Article 11, shall be strictly adhered to by the **Contractor**.

9.3 If the **Contractor** shall fail to adhere to the approved progress schedule, or to the schedule as revised pursuant to Article 11, it shall promptly adopt such other or additional **Means and Methods of Construction**, at its sole cost and expense, as will make up for the time lost and will assure completion in accordance with the approved progress schedule. The approval by the **City** of a progress schedule which is shorter than the time allotted under the **Contract** shall not create any liability for the **City** if the approved progress schedule is not met.

9.4 The **Contractor** will not receive any payments until the proposed progress schedule is submitted.

ARTICLE 10. REQUESTS FOR INFORMATION OR APPROVAL

10.1 From time to time as the **Work** progresses and in the sequence indicated by the approved progress schedule, the **Contractor** shall submit to the **Engineer** a specific request in writing for each item of information or approval required by the **Contractor**. These requests shall state the latest date upon which the information or approval is actually required by the **Contractor**, and shall be submitted in a reasonable time in advance thereof to provide the **Engineer** a sufficient time to act upon such submissions, or any necessary re-submissions thereof.

10.2 The **Contractor** shall not have any right to an extension of time on account of delays due to the **Contractor's** failure to submit requests for the required information or the required approval in accordance with the above requirements.

ARTICLE 11. NOTICE OF CONDITIONS CAUSING DELAY AND DOCUMENTATION OF DAMAGES CAUSED BY DELAY

11.1 After the commencement of any condition which is causing or may cause a delay in completion of the **Work**, including conditions for which the **Contractor** may be entitled to an extension of time, the following notifications and submittals are required:

11.1.1 Within fifteen (15) **Days** after the **Contractor** becomes aware or reasonably should be

aware of each such condition, the **Contractor** must notify the **Resident Engineer** or **Engineer**, as directed by the **Commissioner**, in writing of the existence, nature and effect of such condition upon the approved progress schedule and the **Work**, and must state why and in what respects, if any, the condition is causing or may cause a delay. Such notice shall include a description of the construction activities that are or could be affected by the condition and may include any recommendations the **Contractor** may have to address the delay condition and any activities the **Contractor** may take to avoid or minimize the delay.

11.1.2 If the **Contractor** shall claim to be sustaining damages for delay as provided for in this Article 11,within forty-five (45) **Days** from the time such damages are first incurred for each such condition, the **Contractor** shall submit to the **Commissioner** a verified written statement of the details and estimates of the amounts of such damages, including categories of expected damages and projected monthly costs, together with documentary evidence of such damages as the **Contractor** may have at the time of submission ("statement of delay damages"), as further detailed in Article 11.6. The **Contractor** may submit the above statement within such additional time as may be granted by the **Commissioner** in writing upon written request therefor.

11.1.3 Articles 11.1.1 and 11.1.2 do not relieve the **Contractor** of its obligation to comply with the provisions of Article 44.

11.2 Failure of the **Contractor** to strictly comply with the requirements of Article 11.1.1 may, inthe discretion of the **Commissioner**, be deemed sufficient cause to deny any extension of time on account of delay arising out of such condition. Failure of the **Contractor** to strictly comply with the requirements of both Articles 11.1.1 and 11.1.2 shall be deemed a conclusive waiver by the **Contractor** of any and all claims for damages for delay arising from such condition and no right to recover on such claims shall exist.

11.3 When appropriate and directed by the **Engineer**, the progress schedule shall be revised by the **Contractor** until finally approved by the **Engineer**. The revised progress schedule must be strictly adhered to by the **Contractor**.

11.4 Compensable Delays

11.4.1 The **Contractor** agrees to make claim only for additional costs attributable to delayin the performance of this **Contrac**t necessarily extending the time for completion of the **Work** or resulting from acceleration directed by the **Commissioner** and required to maintain the progress schedule, occasioned solely by any act or omission to act of the **City** listed below. The **Contractor** also agrees that delay from any other cause shall be compensated, if at all, solely by an extension of time to complete the performance of the **Work**.

11.4.1.1 The failure of the **City** to take reasonable measures to coordinate and progress the **Work** to the extent required by the **Contract**, except that the City shall not be responsible for the **Contractor's** obligation to coordinate and progress the **Work** of its **Subcontractors**.

11.4.1.2 Unreasonable delays attributable to the review of shop drawings, the issuance of change orders, or the cumulative impact of change orders that were not brought about by any act or omission of the **Contractor**.

11.4.1.3 The unavailability of the **Site** caused by acts or omissions of the **City**..

11.4.1.4 The issuance by the **Engineer** of a stop work order that was not brought about through any act or omission of the **Contractor**.

11.4.1.5 Differing site conditions or environmental hazards that were neitherknown nor reasonably ascertainable on a pre-bid inspection of the **Site**or review

of the bid documents or other publicly available sources, and that are not ordinarily encountered in the **Project**'s geographical area or neighborhood or in the type of **Work** to be performed.

11.4.1.6 Delays caused by the **City's** bad faith or its willful, malicious, or grossly negligent conduct;

11.4.1.7 Delays not contemplated by the parties;

11.4.1.8 Delays so unreasonable that they constitute an intentional abandonment of the **Contract** by the **City**; and

11.4.1.9 Delays resulting from the **City's** breach of a fundamental obligation of the **Contract**.

11.4.2 No claim may be made for any alleged delay in **Substantial Completion** of the **Work** if the **Work** will be or is substantially completed by the date of **Substantial Completion** provided for in Schedule A unless acceleration has been directed by the **Commissioner** to meet the date of **Substantial Completion** set forth in Schedule A, or unless there is a provision in the **Contract** providing for additional compensation for early completion.

11.4.3 The provisions of this Article 11 apply only to claims for additional costs attributable to delay and do not preclude determinations by the **Commissioner** allowing reimbursements for additional costs for **Extra Work** pursuant to Articles 25 and 26 of this **Contract**. To the extent that any cost attributable to delay is reimbursed as part of a change order, no additional claim for compensation under this Article 11 shall be allowed.

11.5 Non-Compensable Delays. The **Contractor** agrees to make no claim for, and is deemed to have included in its bid prices for the various items of the **Contract**, the extra/additional costs attributable to any delays caused by or attributable to the items set forth below. For such items, the **Contractor** shall be compensated, if at all, solely by an extension of time to complete the performance of the **Work**, in accordance with the provisions of Article 13. Such extensions of time will be granted, if at all, pursuant to the grounds set forth in Article 13.3.

11.5.1 The acts or omissions of any third parties, including but not limited to **Other Contractors**, public/ governmental bodies (other than **City Agencies**), utilities or private enterprises, who are disclosed in the **Contract Documents** or are ordinarily encountered or generally recognized as related to the **Work**;

11.5.2 Any situation which was within the contemplation of the parties at the time of entering into the **Contract**, including any delay indicated or disclosed in the **Contract Documents** or that would be generally recognized by a reasonably prudent contractor as related to the nature of the **Work**, and/or the existence of any facility or appurtenance owned, operated or maintained by any third party, as indicated or disclosed in the **Contract Documents** or ordinarily encountered or generally recognized as related to the nature of the **Work**;

11.5.3 Restraining orders, injunctions or judgments issued by a court which were caused by a Contractor's submission, action or inaction or by a Contractor's **Means and Methods of Construction**, or by third parties, unless such order, injunction or judgment was the result of an act or omission by the **City**;

11.5.4 Any labor boycott, strike, picketing, lockout or similar situation;

11.5.5 Any shortages of supplies or materials, or unavailability of equipment, required by the **Contract Work**;

11.5.6 Climatic conditions, storms, floods, droughts, tidal waves, fires, hurricanes, earthquakes, landslides or other catastrophes or acts of God, or acts of war or of the public enemy or terrorist acts, including the **City's** reasonable responses thereto; and

11.5.7 **Extra Work** which does not significantly affect the overall completion of the **Contract**, reasonable delays in the review or issuance of change orders or field orders and/or in shop drawing reviews or approvals.

11.6 Required Content of Submission of Statement of Delay Damages

11.6.1 In the verified written statement of delay damages required by Article 11.1.2, the following information shall be provided by the **Contractor**:

11.6.1.1 For each delay, the start and end dates of the claimed periods of delay and, in addition, a description of the operations that were delayed, an explanation of how they were delayed, and the reasons for the delay, including identifying the applicable act or omission of the City listed in Article 11.4.

11.6.1.2 A detailed factual statement of the claim providing all necessary dates, locations and items of **Work** affected by the claim.

11.6.1.3 The estimated amount of additional compensation sought and a breakdown of that amount into categories as described in Article 11.7.

11.6.1.4 Any additional information requested by the **Commissioner**.

11.7 Recoverable Costs

11.7.1 Delay damages may be recoverable for the following costs actually and necessarily incurred in the performance of the **Work**:

11.7.1.1 Direct labor, including payroll taxes (subject to statutory wage caps) and supplemental benefits, based on time and materials records;

11.7.1.2 Necessary materials (including transportation to the **Site**), based on time and material records;

11.7.1.3 Reasonable rental value of necessary plant and equipment other than small tools, plus fuel/energy costs according to the applicable formula set forth in Articles 26.2.4 and/or 26.2.8, based on time and material records;

11.7.1.4 Additional insurance and bond costs;

11.7.1.5 Extended **Site** overhead, field office rental, salaries of field office staff, on-site project managers and superintendents, field office staff vehicles, **Project-**specific storage, field office utilities and telephone, and field office consumables;

11.7.1.6 Labor escalation costs based on actual costs;

11.7.1.7 Materials and equipment escalation costs based on applicable industry indices unless documentation of actual increased cost is provided;

11.7.1.8 Additional material and equipment storage costs based on actual documented costs and additional costs necessitated by extended manufacturer warranty periods; and

11.7.1.9 Extended home office overhead calculated based on the following formula:

(1) Subtract from the original **Contract** amount the amount earned by original contractual **Substantial Completion** date (not

including change orders);

(2) Remove 15% overhead and profit from the calculation in item (1) by dividing the results of item (1) by 1.15;

(3) Multiply the result of item (2) by 7.25% for the total home office overhead;

(4) Multiply the result of item (3) by 7.25% for the total profit; and

(5) The total extended home office overhead will be the total of items (3) and (4).

11.7.2 Recoverable Subcontractor Costs. When the **Work** is performed by a **Subcontractor**, the **Contractor** may be paid the actual and necessary costs of such subcontracted **Work** as outlined above in Articles 11.7.1.1 through 11.7.1.8, and an additional overhead of 5% of the costs outlined in Articles 11.7.1.1 through 11.7.1.3.

11.7.3 Non-Recoverable Costs. The parties agree that the **City** will have no liability for the following items and the **Contractor** agrees it shall make no claim for the following items:

11.7.3.1 Profit, or loss of anticipated or unanticipated profit, except as provided in Article 11.7.1.9;

11.7.3.2 Consequential damages, including, but not limited to, construction or bridge loans or interest paid on such loans, loss of bonding capacity, bidding opportunities, or interest in investment, or any resulting insolvency;

11.7.3.3 Indirect costs or expenses of any nature except those included in Article 11.7.1;

11.7.3.4 Direct or indirect costs attributable to performance of **Work** where the **Contractor**, because of situations or conditions within its control, hasnot progressed the **Work** in a satisfactory manner; and

11.7.3.5 Attorneys' fees and dispute and claims preparation expenses.

11.8 Any claims for delay under this Article 11 are not subject to the jurisdiction of the Contract Dispute Resolution Board pursuant to the dispute resolution process set forth in Article 27.

11.9 Any compensation provided to the **Contractor** in accordance with this Article 11 will be made pursuant to a claim filed with the **Comptroller**. Nothing in this Article 11 extendsthe time for the **Contractor** to file an action with respect to a claim within six months after **Substantial Completion** pursuant to Article 56.

ARTICLE 12. COORDINATION WITH OTHER CONTRACTORS

12.1 During the progress of the **Work**, **Other Contractors** may be engaged in performing other work or may be awarded other contracts for additional work on this **Project**. In that event, the **Contractor** shall coordinate the **Work** to be done hereunder with the work of such **Other Contractors** and the **Contractor** shall fully cooperate with such **Other Contractors** and carefully fit its own **Work** to that provided under other contracts as may be directed by the **Engineer**. The **Contractor** shall not commit or permit any act which will interfere with the performance of work by any **Other Contractors**.

12.2 If the **Engineer** determines that the **Contractor** is failing to coordinate its **Work** with the work of **Other Contractors** as the **Engineer** has directed, then the **Commissioner** shall have the right to withhold any payments otherwise due hereunder until the **Contractor** completely complies with the **Engineer's** directions.

12.3 The **Contractor** shall notify the **Engineer** in writing if any **Other Contractor** on this **Project** is failing to coordinate its work with the **Work** of this **Contract**. If the **Engineer** finds such charges to be true, the **Engineer** shall promptly issue such directions to the **Other Contractor** with respect thereto as the situation may require. The **City** shall not, however, be liable for any damages suffered by any **Other Contractor's** failure to coordinate its work with the **Work** of this **Contract** or by reason of the **Other Contractor's** failure to promptly comply with the directions so issued by the **Engineer**, or by reason of any **Other Contractor's** default in performance, it being understood that the **City** does not guarantee the responsibility or continued efficiency of any contractor. The **Contractor** agrees to make no claim against the **City** for any damages relating to or arising out of any directions issued by the **Engineer** pursuant to this Article 12 (including but not limited to the failure of any **Other Contractor** to comply or promptly comply with such directions), or the failure of any **Other Contractor** to coordinate its work, or the default in performance of any **Other Contractor**.

12.4 The **Contractor** shall indemnify and hold the **City** harmless from any and all claims or judgments for damages and from costs and expenses to which the **City** may be subjected or which it may suffer or incur by reason of the **Contractor's** failure to comply with the **Engineer's** directions promptly; and the **Comptroller** shall have the right to exercise the powers reserved in Article 23 with respect to any claims which may be made for damages due to the **Contractor's** failure to comply with the **Engineer's** directions promptly. Insofar as the facts and **Law** relating to any claim would preclude the **City** from being completely indemnified by the **Contractor**, the **City** shall be partially indemnified by the **Contractor** to the fullest extent provided by **Law**.

12.5 Should the **Contractor** sustain any damage through any act or omission of any **Other Contractor** having a contract with the **City** for the performance of work upon the **Site** or of work which may be necessary to be performed for the proper prosecution of the **Work** to be performed hereunder, or through any act or omission of a subcontractor of such **Other Contractor**, the **Contractor** shall have no claim against the **City** for such damage, but shall have a right to recover such damage from the **Other**
12.5 **Contractor** under the provision similar to the following provisions which apply to this Contract and have been or will be inserted in the contracts with such Other Contractors:

> 12.5.1 Should any **Other Contractor** having or who shall hereafter have a contract with the **City** for the performance of work upon the **Site** sustain any damage through any act or omission of the **Contractor** hereunder or through any act or omission of any **Subcontractor** of the **Contractor**, the **Contractor** agrees to reimburse such **Other Contractor** for all such damages and to defend at its own expense any action based upon such claim and if any judgment or claim (even if the allegations of the action are without merit) against the **City** shall be allowed the **Contractor** shall pay or satisfy such judgment or claim and pay all costs and expenses in connection therewith and agrees to indemnify and hold the **City** harmless from all such claims. Insofar as the facts and **Law** relating to any claim would preclude the **City** from being completely indemnified by the **Contractor**, the **City** shall be partially indemnified by the **Contractor** to the fullest extent provided by **Law**.

12.6 The **City's** right to indemnification hereunder shall in no way be diminished, waived or discharged by its recourse to assessment of liquidated damages as provided in Article 15, or by the exercise of any other remedy provided for by **Contract** or by **Law**.

ARTICLE 13. EXTENSION OF TIME FOR PERFORMANCE

13.1 If performance by the **Contractor** is delayed for a reason set forth in Article 13.3, the **Contractor** may be allowed a reasonable extension of time in conformance with this Article 13 and the **PPB**

Rules.

13.2 Any extension of time may be granted only by the **ACCO** or by the Board for the Extension of Time (hereafter "Board") (as set forth below) upon written application by the **Contractor**.

13.3 Grounds for Extension: If such application is made, the **Contractor** shall be entitled to an extension of time for delay in completion of the **Work** caused solely:

13.3.1 By the acts or omissions of the **City**, its officials, agents or employees; or

13.3.2 By the act or omissions of **Other Contractors** on this **Project**; or

13.3.3 By supervening conditions entirely beyond the control of either party hereto (such as, but not limited to, acts of God or the public enemy, excessive inclement weather, war or other national emergency making performance temporarily impossible or illegal, or strikes or labor disputes not brought about by any act or omission of the **Contractor**).

13.3.4 The **Contractor** shall, however, be entitled to an extension of time for such causes only for the number of **Days** of delay which the **ACCO** or the Board may determine to be due solely to such causes, and then only if the **Contractor** shall have strictly complied with all of the requirements of Articles 9 and 10.

13.4 The **Contractor** shall not be entitled to receive a separate extension of time for each of several causes of delay operating concurrently, but, if at all, only for the actual period of delay in completion of the **Work** as determined by the **ACCO** or the Board, irrespective of the number of causes contributing to produce such delay. If one of several causes of delay operating concurrently results from any act, fault or omission of the **Contractor** or of its **Subcontractors** or **Materialmen**, and would of itself (irrespective of the concurrent causes) have delayed the **Work**, no extension of time will be allowed for the period ofdelay resulting from such act, fault or omission.

13.5 The determination made by the **ACCO** or the Board on an application for an extension of time shall be binding and conclusive on the **Contractor**.

13.6 The **ACCO** or the Board acting entirely within their discretion may grant an application for an extension of time for causes of delay other than those herein referred.

13.7 Permitting the **Contractor** to continue with the **Work** after the time fixed for its completion has expired, or after the time to which such completion may have been extended has expired, or the making of any payment to the **Contractor** after such time, shall in no way operate as a waiver on the part of the **City** of any of its rights under this **Contract**.

13.8 Application for Extension of Time:

13.8.1 Before the **Contractor's** time extension request will be considered, the **Contractor** shall notify the **ACCO** of the condition which allegedly has caused or is causing the delay, and shall submit a written application to the **ACCO** identifying:

13.8.1(a) The **Contractor**; the registration number; and **Project** description;

13.8.1(b) Liquidated damage assessment rate, as specified in the **Contract**;

13.8.1(c) Original total bid price;

13.8.1(d) The original **Contract** start date and completion date;

13.8.1(e) Any previous time extensions granted (number and duration); and

13.8.1(f) The extension of time requested.

13.8.2 In addition, the application for extension of time shall set forth in detail:

13.8.2(a) The nature of each alleged cause of delay in completing the **Work**;

13.8.2(b) The date upon which each such cause of delay began and ended and the number of **Days** attributable to each such cause;

13.8.2(c) A statement that the **Contractor** waives all claims except for those delineated in the application, and the particulars of any claims which the **Contractor** does not agree to waive. For time extensions for **Substantial Completion** and final completion payments, the application shall include a detailed statement of the dollar amounts of each element of claim item reserved; and

13.8.2(d) A statement indicating the **Contractor's** understanding that the time extension is granted only for purposes of permitting continuation of **Contract** performance and payment for **Work** performed and that the **City** retains its right to conduct an investigation and assess liquidated damages as appropriate in the future.

13.9 Analysis and Approval of Time Extensions:

13.9.1 For time extensions for partial payments, a written determination shall be made by the **ACCO** who may, for good and sufficient cause, extend the time for the performance of the **Contract** as follows:

13.9.1(a) If the **Work** is to be completed within six (6) months, the time for performance may be extended for sixty (60) **Days**;

13.9.1(b) If the **Work** is to be completed within less than one (1) year but more than six (6) months, an extension of ninety (90) **Days** may be granted;

13.9.1(c) If the **Contract** period exceeds one (1) year, besides the extension granted in Article 13.9.1(b), an additional thirty (30) **Days** may be granted for each multipleof six (6) months involved beyond the one (1) year period; or

13.9.1(d) If exceptional circumstances exist, the **ACCO** may extend the time for performance beyond the extensions in Articles 13.9.1(a), 13.9.1(b), and 13.9.1(c). In that event, the **ACCO** shall file with the Mayor's Office of Contract Services a written explanation of the exceptional circumstances.

13.9.2 For extensions of time for **Substantial Completion** and final completion payments, the **Engineer**, in consultation with the **ACCO**, shall prepare a written analysis of the delay (including a preliminary determination of the causes of delay, the beginning and end dates for each such cause of delay, and whether the delays are excusable under the terms of this **Contract**). The report shall be subject to review by and approval of the Board, which shall have authority to question its analysis and determinations and request additional facts or documentation. The report as reviewed and made final by the Board shall be made a part of the **Agency** contract file. Neither the report itself nor anything contained therein shall operate as a

waiver or release of any claim the **City** may have against the **Contractor** for either actual or liquidated damages.

13.9.3 Approval Mechanism for Time Extensions for **Substantial Completion** or Final Completion Payments: An extension shall be granted only with the approval of the Board which is comprised of the **ACCO** of the **Agency**, the **City** Corporation Counsel, and the **Comptroller**, or their authorized representatives.

13.9.4 Neither the granting of any application for an extension of time to the **Contractor** or any **Other Contractor** on this **Project** nor the papers, records or reports related to any application for or grant of an extension of time or determination related thereto shall be referred to or offered in evidence by the **Contractor** or its attorneys in any action or proceeding.

13.10 No Damage for Delay: The **Contractor** agrees to make no claim for damages for delay in the performance of this **Contract** occasioned by any act or omission to act of the **City** or any of its representatives, except as provided for in Article 11.

ARTICLE 14. COMPLETION AND FINAL ACCEPTANCE OF THE WORK

14.1 Date for **Substantial Completion**: The **Contractor** shall substantially complete the **Work** within the time fixed in Schedule A of the General Conditions, or within the time to which such **Substantial Completion** may be extended.

14.2 Determining the Date of **Substantial Completion**: The **Work** will be deemed to be substantially complete when the two conditions set forth below have been met.

14.2.1 Inspection: The **Engineer** or **Resident Engineer**, as applicable, has inspected the **Work** and has made a written determination that it is substantially complete.

14.2.2 Approval of **Final Approved Punch List** and Date for **Final Acceptance**: Following inspection of the **Work**, the **Engineer/Resident Engineer** shall furnish the **Contractor** with a final punch list, specifying all items of **Work** to be completed and proposing dates for the completion of each specified item of **Work**. The **Contractor** shall then submit in writing to the **Engineer/Resident Engineer** within ten (10) **Days** of the **Engineer/Resident Engineer** furnishing the final punch list either acceptance of the dates or proposed alternative dates for the completion of each specified item of **Work**. If the **Contractor** neither accepts the dates nor proposes alternative dates within ten (10) **Days**, the schedule proposed by the **Engineer/Resident Engineer** shall be deemed accepted. If the **Contractor** proposes alternative dates, then, within a reasonable time after receipt, the **Engineer/Resident Engineer**, in a written notification to the **Contractor**, shall approve the **Contractor's** completion dates or, if they are unable to agree, the **Engineer/Resident Engineer** shall establish dates for the completion of each item of **Work**. The latest completion date specified shall be the date for **Final Acceptance** of the **Work**.

14.3 Date of **Substantial Completion**. The date of approval of the **Final Approved Punch List**, shall be the date of **Substantial Completion**. The date of approval of the **Final Approved Punch List** shall be either (a) if the **Contractor** approves the final punch list and proposed dates for completion furnished by the **Engineer/Resident Engineer**, the date of the **Contractor**'s approval; or (b) if the **Contractor** neither accepts the dates nor proposes alternative dates, ten (10) **Days** after the **Engineer/Resident Engineer** furnishes the **Contractor** with a final punch list and proposed dates for completion; or (c) if the **Contractor** proposes alternative dates, the date that the **Engineer/Resident Engineer** sends written notification to the

Contractor either approving the **Contractor**'s proposed alternative dates or establishing dates for the completion for each item of **Work**.

14.4 Determining the Date of **Final Acceptance**: The **Work** will be accepted as final and complete as of the date of the **Engineer**'s/**Resident Engineer**'s inspection if, upon such inspection, the **Engineer/Resident Engineer** finds that all items on the **Final Approved Punch List** are complete andno further **Work** remains to be done. The **Commissioner** will then issue a written determination of **Final Acceptance**.

14.5 Request for Inspection: Inspection of the **Work** by the **Engineer/Resident Engineer** for the purpose of **Substantial Completion** or **Final Acceptance** shall be made within fourteen (14) **Days** after receipt of the **Contractor's** written request therefor.

14.6 Request for Re-inspection: If upon inspection for the purpose of **Substantial Completion** or **Final Acceptance**, the **Engineer/Resident Engineer** determines that there are items of **Work** still to be performed, the **Contractor** shall promptly perform them and then request a re-inspection. If upon re-inspection, the **Engineer/Resident Engineer** determines that the **Work** is substantially complete or finally accepted, the date of such re-inspection shall be the date of **Substantial Completion** or **Final Acceptance**. Re-inspection by the **Engineer/Resident Engineer** shall be made within ten (10) **Days** after receipt of the **Contractor's** written request therefor.

14.7 Initiation of Inspection by the **Engineer/Resident Engineer**: If the **Contractor** does not request inspection or re-inspection of the **Work** for the purpose of **Substantial Completion** or **Final Acceptance**, the **Engineer/Resident Engineer** may initiate such inspection or re-inspection.

ARTICLE 15. LIQUIDATED DAMAGES

15.1 In the event the **Contractor** fails to substantially complete the **Work** within the time fixed for such **Substantial Completion** in Schedule A of the General Conditions, plus authorized time extensions, or if the **Contractor**, in the sole determination of the **Commissioner**, has abandoned the **Work**, the **Contractor** shall pay to the **City** the sum fixed in Schedule A of the General Conditions, for each and every **Day** that the time consumed in substantially completing the **Work** exceeds the time allowed therefor; which said sum, in view of the difficulty of accurately ascertaining the loss which the **City** will suffer by reason of delay in the **Substantial Completion** of the **Work** hereunder, is hereby fixed and agreed as the liquidated damages that the **City** will suffer by reason of such delay, and not as a penalty. This Article 15 shall also apply to the **Contractor** whether or not the **Contractor** is defaulted pursuant to Chapter X of this **Contract**. Neither the failure to assess liquidated damages nor the granting of any time extension shall operate as a waiver or release of any claim the **City** may have against the **Contractor** for either actual or liquidated damages.

15.2 Liquidated damages received hereunder are not intended to be nor shall they be treated as either a partial or full waiver or discharge of the **City's** right to indemnification, or the **Contractor's** obligation to indemnify the **City**, or to any other remedy provided for in this **Contract** or by **Law**.

15.3 The **Commissioner** may deduct and retain out of the monies which may become due hereunder, the amount of any such liquidated damages; and in case the amount which may become due hereunder shall be less than the amount of liquidated damages suffered by the **City**, the **Contractor** shall be liable to pay the difference.

ARTICLE 16. OCCUPATION OR USE PRIOR TO COMPLETION

16.1 Unless otherwise provided for in the **Specifications**, the **Commissioner** may take over, use, occupy or operate any part of the **Work** at any time prior to **Final Acceptance**, upon written notification to the **Contractor**. The **Engineer** or **Resident Engineer**, as applicable, shall inspect the part of the**Work** to be taken over, used, occupied, or operated, and will furnish the **Contractor** with a written statement of the **Work**, if any, which remains to be performed on such part. The **Contractor** shall not object to, nor interfere with, the **Commissioner's** decision to exercise the rights granted by Article 16. In the event the **Commissioner** takes over, uses, occupies, or operates any part of the **Work:**

16.1.1 the **Engineer/Resident Engineer** shall issue a written determination of **Substantial Completion** with respect to such part of the **Work**;

16.1.2 the **Contractor** shall be relieved of its absolute obligation to protect such part of the unfinished **Work** in accordance with Article 7;

16.1.3 the **Contractor's** guarantee on such part of the **Work** shall begin on the date of such use by the **City**; and;

16.1.4 the **Contractor** shall be entitled to a return of so much of the amount retained in accordance with Article 21 as it relates to such part of the **Work**, except so much thereof as may be retained under Articles 24 and 44.

CHAPTER IV: SUBCONTRACTS AND ASSIGNMENTS

ARTICLE 17. SUBCONTRACTS

17.1 The **Contractor** shall not make subcontracts totaling an amount more than the percentage of the total **Contract** price fixed in Schedule A of the General Conditions, without prior written permission from the **Commissioner**. All subcontracts made by the **Contractor** shall be in writing. No **Work** may be performed by a **Subcontractor** prior to the **Contractor** entering into a written subcontract with the **Subcontractor** and complying with the provisions of this Article 17.

17.2 Before making any subcontracts, the **Contractor** shall submit a written statement to the **Commissioner** giving the name and address of the proposed **Subcontractor**; the portion of the **Work** and materials which it is to perform and furnish; the cost of the subcontract; the VENDEX questionnaire if required; the proposed subcontract if requested by the **Commissioner**; and any other information tending to prove that the proposed **Subcontractor** has the necessary facilities, skill, integrity, past experience, and financial resources to perform the **Work** in accordance with the terms and conditions of this **Contract**.

17.3 In addition to the requirements in Article 17.2, **Contractor** is required to list the **Subcontractor** in the web based Subcontractor Reporting System through the City's Payee Information Portal (PIP), available at www.nyc.gov/pip.[1]For each **Subcontractor** listed, **Contractor** is required to provide the following information: maximum contract value, description of **Subcontractor's** Work, start and end date of the subcontract and identification of the **Subcontractor**'s industry. Thereafter, **Contractor** will be required to report in the system the payments made to each **Subcontractor** within 30 days of making the

[1] In order to use the new system, a PIP account will be required. Detailed instructions on creating a PIP account and using the new system are also available at www.nyc.gov/pip. Additional assistance with PIP may be obtained by emailing the Financial Information Services Agency Help Desk at pip@fisa.nyc.gov.

payment. If any of the required information changes throughout the Term of the **Contract**, **Contractor** will be required to revise the information in the system.

Failure of the **Contractor** to list a **Subcontractor** and/or to report **Subcontractor** payments in a timely fashion may result in the **Commissioner** declaring the **Contractor** in default of the **Contract** and will subject **Contractor** to liquidated damages in the amount of $100 per day for each day that the **Contractor** fails to identify a **Subcontractor** along with the required information about the **Subcontractor** and/or fails to report payments to a **Subcontractor**, beyond the time frames set forth herein or in the notice from the **City**. Article 15 shall govern the issue of liquidated damages.

17.4 If an approved **Subcontractor** elects to subcontract any portion of its subcontract, the proposed sub-subcontract shall be submitted in the same manner as directed above.

17.5 The **Commissioner** will notify the **Contractor** in writing whether the proposed **Subcontractor** is approved. If the proposed **Subcontractor** is not approved, the **Contractor** may submit another proposed **Subcontractor** unless the **Contractor** decides to do the **Work**. No **Subcontractor** shall be permitted to enter or perform any work on the **Site** unless approved.

17.6 Before entering into any subcontract hereunder, the **Contractor** shall provide the proposed **Subcontractor** with a complete copy of this document and inform the proposed **Subcontractor** fully and completely of all provisions and requirements of this **Contract** relating either directly or indirectly to the **Work** to be performed and the materials to be furnished under such subcontract, and every such **Subcontractor** shall expressly stipulate that all labor performed and materials furnished by the **Subcontractor** shall strictly comply with the requirements of this **Contract.**

17.7 Documents given to a prospective **Subcontractor** for the purpose of soliciting the **Subcontractor's** bid shall include either a copy of the bid cover or a separate information sheet setting forth the **Project** name, the **Contract** number (if available), the **Agency** (as noted in Article 2.1.6), and the **Project's** location.

17.8 The **Commissioner's** approval of a **Subcontractor** shall not relieve the **Contractor** of any of its responsibilities, duties, and liabilities hereunder. The **Contractor** shall be solely responsible to the **City** for the acts or defaults of its **Subcontractor** and of such **Subcontractor's** officers, agents, and employees, each of whom shall, for this purpose, be deemed to be the agent or employee of the **Contractor** to the extent of its subcontract.

17.9 If the **Subcontractor** fails to maintain the necessary facilities, skill, integrity, past experience, and financial resources (other than due to the **Contractor's** failure to make payments where required) to perform the **Work** in accordance with the terms and conditions of this **Contract**, the **Contractor** shall promptly notify the **Commissioner** and replace such **Subcontractor** with a newly approved **Subcontractor** in accordance with this Article 17.

17.10 The **Contractor** shall be responsible for ensuring that all **Subcontractors** performing **Work** at the **Site** maintain all insurance required by **Law**.

17.11 The **Contractor** shall promptly, upon request, file with the **Engineer** a conformed copy ofthe subcontract and its cost. The subcontract shall provide the following:

17.11.1 Payment to **Subcontractors**: The agreement between the **Contractor** and its **Subcontractor** shall contain the same terms and conditions as to method of payment for **Work**, labor, and materials, and as to retained percentages, as are contained in this **Contract**.

17.11.2 Prevailing Rate of Wages: The agreement between the **Contractor** and its **Subcontractor** shall include the prevailing wage rates and supplemental benefits to be paid in accordance with Labor Law Section 220.

17.11.3 Section 6-123 of the Administrative Code: Pursuant to the requirements of Section 6-123 of the Administrative Code, every agreement between the **Contractor** and a **Subcontractor** in excess of fifty thousand ($50,000) dollars shall include a provision that the **Subcontractor** shall not engage in any unlawful discriminatory practice as defined in Title VIII of the Administrative Code (Section 8-101 *et seq*.).

17.11.4 All requirements required pursuant to federal and/or state grant agreement(s), if applicable to the **Work**.

17.12 The **Commissioner** may deduct from the amounts certified under this **Contract** to be due to the **Contractor**, the sum or sums due and owing from the **Contractor** to the **Subcontractors** according to the terms of the said subcontracts, and in case of dispute between the **Contractor** and its **Subcontractor**, or **Subcontractors**, as to the amount due and owing, the **Commissioner** may deduct and withhold from the amounts certified under this **Contract** to be due to the **Contractor** such sum or sums as may be claimed by such **Subcontractor**, or **Subcontractors**, in a sworn affidavit, to be due and owing until such time as such claim or claims shall have been finally resolved.

17.13 On contracts where performance bonds and payment bonds are executed, the **Contractor** shall include on each requisition for payment the following data: **Subcontractor's** name, value of the subcontract, total amount previously paid to **Subcontractor** for **Work** previously requisitioned, and the amount, including retainage, to be paid to the **Subcontractor** for **Work** included in the requisition.

17.14 On **Contracts** where performance bonds and payment bonds are not executed, the **Contractor** shall include with each requisition for payment submitted hereunder, a signed statement from each and every **Subcontractor** and/or **Materialman** for whom payment is requested in such requisition. Such signed statement shall be on the letterhead of the **Subcontractor** and/or **Materialman** for whom payment is requested and shall (i) verify that such **Subcontractor** and/or **Materialman** has been paid in full for all **Work** performed and/or material supplied to date, exclusive of any amount retained and any amount included on the current requisition, and (ii) state the total amount of retainage to date, exclusive of any amount retained on the current requisition.

ARTICLE 18. ASSIGNMENTS

18.1 The **Contractor** shall not assign, transfer, convey or otherwise dispose of this **Contract**, or the right to execute it, or the right, title or interest in or to it or any part thereof, or assign, by power of attorney or otherwise any of the monies due or to become due under this **Contract**, unless the previous written consent of the **Commissioner** shall first be obtained thereto, and the giving of any such consent to a particular assignment shall not dispense with the necessity of such consent to any further or other assignments.

18.2 Such assignment, transfer, conveyance or other disposition of this **Contract** shall not be valid until filed in the office of the **Commissioner** and the **Comptroller**, with the written consent of the **Commissioner** endorsed thereon or attached thereto.

18.3 Failure to obtain the previous written consent of the **Commissioner** to such an assignment,

transfer, conveyance or other disposition, may result in the revocation and annulment of this **Contract**. The **City** shall thereupon be relieved and discharged from any further liability to the **Contractor**, its assignees, transferees or sublessees, who shall forfeit and lose all monies therefor earned under the **Contract**, except so much as may be required to pay the **Contractor's** employees.

18.4 The provisions of this clause shall not hinder, prevent, or affect an assignment by the **Contractor** for the benefit of its creditors made pursuant to the **Laws** of the State of New York.

18.5 This **Contract** may be assigned by the **City** to any corporation, agency or instrumentality having authority to accept such assignment.

CHAPTER V: CONTRACTOR'S SECURITY AND GUARANTEE

ARTICLE 19. SECURITY DEPOSIT

19.1 If performance and payment bonds are required, the **City** shall retain the bid security to ensure that the successful bidder executes the **Contract** and furnishes the required payment and performance security within ten (10) **Days** after notice of the award of the **Contract**. If the successful bidder fails to execute the **Contract** and furnish the required payment and performance security, the **City** shall retain such bid security as set forth in the Information for Bidders. If the successful bidder executes the **Contract** and furnishes the required payment and performance security, the **City** shall return the bid security within a reasonable time after the furnishing of such bonds and execution of the **Contract** by the **City**.

19.2 If performance and payment bonds are not required, the bid security shall be retained by the **City** as security for the **Contractor**'s faithful performance of the **Contract**. If partial payments are provided, the bid security will be returned to the **Contractor** after the sum retained under Article 21 equals the amount of the bid security, subject to other provisions of this **Contract**. If partial payments are not provided, the bid security will be released when final payment is certified by the **City** for payment.

19.3 If the **Contractor** is declared in default under Article 48 prior to the return of the deposit, or if any claim is made such as referred to in Article 23, the amount of such deposit, or so much thereof as the **Comptroller** may deem necessary, may be retained and then applied by the **Comptroller**:

19.3.1 To compensate the **City** for any expense, loss or damage suffered or incurred by reason of or resulting from such default, including the cost of re-letting and liquidated damages; or

19.3.2 To indemnify the **City** against any and all claims.

ARTICLE 20. PAYMENT GUARANTEE

20.1 On **Contracts** where one hundred (100%) percent performance bonds and payment bonds are executed, this Article 20 does not apply.

20.2 In the event the terms of this **Contract** do not require the **Contractor** to provide a payment bond or where the **Contract** does not require a payment bond for one hundred (100%) percent of the **Contract** price, the **City** shall, in accordance with the terms of this Article 20, guarantee payment of all lawful claims for:

20.2.1 Wages and compensation for labor performed and/or services rendered; and

20.2.2 Materials, equipment, and supplies provided, whether incorporated into the **Work** or not, when demands have been filed with the **City** as provided hereinafter by any person, firm, or corporation which furnished labor, material, equipment, supplies, or any combination thereof, in connection with the **Work** performed hereunder (hereinafter referred to as the "beneficiary") at the direction of the **City** or the **Contractor**.

20.3 The provisions of Article 20.2 are subject to the following limitations and conditions:

20.3.1 If the **Contractor** provides a payment bond for a value that is less than one hundred (100%) percent of the value of the **Contract Work**, the payment bond provided by the **Contractor** shall be primary (and non-contributing) to the payment guarantee provided under this Article 20.

20.3.2 The guarantee is made for the benefit of all beneficiaries as defined in Article 20.2 provided that those beneficiaries strictly adhere to the terms and conditions of Article 20.3.4 and 20.3.5.

20.3.3 Nothing in this Article 20 shall prevent a beneficiary providing labor, services or material for the **Work** from suing the **Contractor** for any amounts due and owing the beneficiary by the **Contractor**.

20.3.4 Every person who has furnished labor or material, to the **Contractor** or to a **Subcontractor** of the **Contractor**, in the prosecution of the **Work** and who has not been paid in full therefor before the expiration of a period of ninety (90) **Days** after the date on which the last of the labor was performed or material was furnished by him/her for which the claim is made, shall have the right to sue on this payment guarantee in his/her own name for the amount, or the balance thereof, unpaid at the time of commencement of the action; provided, however, that a person having a direct contractual relationship with a **Subcontractor** of the **Contractor** but no contractual relationship express or implied with the **Contractor** shall not have a right of action upon the guarantee unless he/she shall have given written notice to the **Contractor** within one hundred twenty (120) **Days** from the date on which the last of the labor was performed or the last of the material was furnished, for which his/her claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the material was furnished or for whom the labor was performed. The notice shall be served by delivering the same personally to the **Contractor** or by mailing the same by registered mail, postage prepaid, in an envelope addressed to the **Contractor** at any place where it maintains an office or conducts its business; provided, however, that where such notice is actually received by the **Contractor** by other means, such notice shall be deemed sufficient.

20.3.5 Except as provided in Labor Law Section 220-g, no action on this payment guarantee shall be commenced after the expiration of the one-year limitations period set forth in Section 137(4)(b) of the State Finance Law.

20.3.6 The **Contractor** shall promptly forward to the **City** any notice or demand received pursuant to Article 20.3.4. The **Contractor** shall inform the **City** of any defenses to the notice or demand and shall forward to the **City** any documents the **City** requests concerning the notice or demand.

20.3.7 All demands made against the **City** by a beneficiary of this payment guarantee shall be presented to the **Engineer** along with all written documentation concerning the demand which the **Engineer** deems reasonably appropriate or necessary, which may include, but shall not be

limited to: the subcontract; any invoices presented to the **Contractor** for payment; the notarized statement of the beneficiary that the demand is due and payable, that a request for payment has been made of the **Contractor** and that the demand has not been paid by the **Contractor** within the time allowed for such payment by the subcontract; and copies of any correspondence between the beneficiary and the **Contractor** concerning such demand. The **City** shall notify the **Contractor** that a demand has been made. The **Contractor** shall inform the **City** of any defenses to the demand and shall forward to the **City** any documents the **City** requests concerning the demand.

20.3.8 The **City** shall make payment only if, after considering all defenses presented by the **Contractor**, it determines that the payment is due and owing to the beneficiary making the demand.

20.3.9 No beneficiary shall be entitled to interest from the **City**, or to any other costs, including, but not limited to, attorneys' fees, except to the extent required by State Finance Law Section 137.

20.3.10

20.4 Upon the receipt by the **City** of a demand pursuant to this Article 20, the **City** may withhold from any payment otherwise due and owing to the **Contractor** under this **Contract** an amount sufficient to satisfy the demand.

20.4.1 In the event the **City** determines that the demand is valid, the **City** shall notify the **Contractor** of such determination and the amount thereof and direct the **Contractor** to immediately pay such amount to the beneficiary. In the event the **Contractor**, within seven (7) **Days** of receipt of such notification from the **City**, fails to pay the beneficiary, such failure shall constitute an automatic and irrevocable assignment of payment by the **Contractor** to the beneficiary for the amount of the demand determined by the **City** to be valid. The **Contractor**, without further notification or other process, hereby gives its unconditional consent to such assignment of payment to the beneficiary and authorizes the **City**, on its behalf, to take all necessary actions to implement such assignment of payment, including without limitation the execution of any instrument or documentation necessary to effectuate such assignment.

20.4.2 In the event that the amount otherwise due and owing to the **Contractor** by the **City** is insufficient to satisfy such demand, the **City** may, at its option, require payment from the **Contractor** of an amount sufficient to cover such demand and exercise any other right to require or recover payment which the **City** may have under **Law** or **Contract**.

20.4.3 In the event the **City** determines that the demand is invalid, any amount withheld pending the **City**'s review of such demand shall be paid to the **Contractor**; provided, however, no lien has been filed. In the event a claim or an action has been filed, the terms and conditions set forth in Article 23 shall apply. In the event a lien has been filed, the parties will be governed by the provisions of the Lien Law of the State of New York.

20.5 The provisions of this Article 20 shall not prevent the **City** and the **Contractor** from resolving disputes in accordance with the **PPB** Rules, where applicable.

20.6 In the event the **City** determines that the beneficiary is entitled to payment pursuant to this Article 20, such determination and any defenses and counterclaims raised by the **Contractor** shall be taken into account in evaluating the **Contractor's** performance.

20.7 Nothing in this Article 20 shall relieve the **Contractor** of the obligation to pay the claims of all

persons with valid and lawful claims against the **Contractor** relating to the **Work**.

20.8 The **Contractor** shall not require any performance, payment or other bonds of any **Subcontractor** if this **Contract** does not require such bonds of the **Contractor**.

20.9 The payment guarantee made pursuant to this Article 20 shall be construed in a manner consistent with Section 137 of the State Finance Law and shall afford to persons furnishing labor or materials to the **Contractor** or its **Subcontractors** in the prosecution of the **Work** under this **Contract** all of the rights and remedies afforded to such persons by such section, including but not limited to, the right to commence an action against the **City** on the payment guarantee provided by this Article 20 within the one-year limitations period set forth in Section 137(4)(b).

ARTICLE 21. RETAINED PERCENTAGE

21.1 If this **Contract** requires one hundred (100%) percent performance and payment security, then as further security for the faithful performance of this **Contract**, the **Commissioner** shall deduct, and retain until the substantial completion of the **Work**, five (5%) percent of the value of **Work** certified for payment in each partial payment voucher.

21.2 If this **Contract** does not require one hundred (100%) percent performance and payment security and if the price for which this **Contract** was awarded does not exceed one million ($1,000,000) dollars, then as further security for the faithful performance of this **Contract**, the **Commissioner** shall deduct, and retain until the substantial completion of the **Work**, five (5%) percent of the value of **Work** certified for payment in each partial payment voucher.

21.3 If this **Contract** does not require one hundred (100%) percent performance and payment security and if the price for which this **Contract** was awarded exceeds one million ($1,000,000) dollars, then as further security for the faithful performance of this **Contract,** the **Commissioner** shall deduct, and retain until the substantial completion of the **Work**, up to ten (10%) percent of the value of **Work** certified for payment in each partial payment voucher. The percentage to be retained is set forth in Schedule A of the General Conditions.

ARTICLE 22. INSURANCE

22.1 Types of Insurance: The **Contractor** shall procure and maintain the following types of insurance if, and as indicated, in Schedule A of the General Conditions (with the minimum limits and special conditions specified in Schedule A). Such insurance shall be maintained from the date the **Contractor** is required to provide Proof of Insurance pursuant to Article 22.3.1 through the date of completion of all required **Work** (including punch list work as certified in writing by the **Resident Engineer**), except for insurance required pursuant to Article 22.1.4, which may terminate upon **Substantial Completion** of the **Contract**. All insurance shall meet the requirements set forth in this Article 22. Wherever this Article requires that insurance coverage be "at least as broad" as a specified form (including all ISO forms), there is no obligation that the form itself be used, provided that the **Contractor** can demonstrate that the alternative form or endorsement contained in its policy provides coverage at least as broad as the specified form.

22.1.1 Commercial General Liability Insurance: The **Contractor** shall provide Commercial General Liability Insurance covering claims for property damage and/or bodily injury, including death, which may arise from any of the operations under this **Contract**. Coverage under this insurance shall be at least as broad as that provided by the latest edition of Insurance

Services Office ("ISO") Form CG 0001. Such insurance shall be "occurrence" based rather than "claims-made" and include, without limitation, the following types of coverage: premises operations; products and completed operations; contractual liability (including the tort liability of another assumed in a contract); broad form property damage; independent contractors; explosion, collapse and underground (XCU); construction means and methods; and incidental malpractice. Such insurance shall contain a "per project" aggregate limit, as specified in Schedule A, that applies separately to operations under this **Contract**.

22.1.1(a) Such Commercial General Liability Insurance shall name the **City** as an Additional Insured. Coverage for the City shall specifically include the **City's** officials and employees, be at least as broad as the latest edition of ISO Form CG 20 10 and provide completed operations coverage at least as broad as the latest edition of ISO Form CG 20 37.

22.1.1(b) Such Commercial General Liability Insurance shall name all other entities designated as additional insureds in Schedule A but only for claims arising from the **Contractor's** operations under this **Contract**, with coverage at least as broad as the latest edition of ISO Form CG 20 26.

22.1.1(c) If the **Work** requires a permit from the Department of Buildings pursuant to 1 RCNY Section 101-08, the **Contractor** shall provide Commercial General Liability Insurance with limits of at least those required by 1 RCNY section 101-08 or greater limits required by the Agency in accordance with Schedule A. If the **Work** does not require such a permit, the minimum limits shall be those provided for in Schedule A.

22.1.1(d) If any of the **Work** includes repair of a waterborne vessel owned by or to be delivered to the **City**, such Commercial General Liability shall include, or be endorsed to include, Ship Repairer's Legal Liability Coverage to protect against, without limitation, liability arising from navigation of such vessels prior to delivery to and acceptance by the **City**.

22.1.2 Workers' Compensation Insurance, Employers' Liability Insurance, and Disability Benefits Insurance: The **Contractor** shall provide, and shall cause its **Subcontractors** to provide, Workers Compensation Insurance, Employers' Liability Insurance, and Disability Benefits Insurance in accordance with the **Laws** of the State of New York on behalf of all employees providing services under this **Contract** (except for those employees, if any, for which the **Laws** require insurance only pursuant to Article 22.1.3).

22.1.3 United States Longshoremen's and Harbor Workers Act and/or Jones Act Insurance: If specified in Schedule A of the General Conditions or if required by **Law**, the **Contractor** shall provide insurance in accordance with the United States Longshoremen's and Harbor Workers Act and/or the Jones Act, on behalf of all qualifying employees providing services under this **Contract**.

22.1.4 Builders Risk Insurance: If specified in Schedule A of the General Conditions, the **Contractor** shall provide Builders Risk Insurance on a completed value form for the total value of the **Work** through **Substantial Completion** of the **Work** in its entirety. Such insurance shall be provided on an All Risk basis and include coverage, without limitation, for windstorm (including named windstorm), storm surge, flood and earth movement. Unless waived by the **Commissioner**, it shall include coverage for ordinance and law, demolition and increased costs of construction, debris removal, pollutant clean up and removal, and expediting costs. Such insurance shall cover, without limitation, (a) all buildings and/or structures involved in the

Work, as well as temporary structures at the **Site**, and (b) any property that is intended to become a permanent part of such building or structure, whether such property is on the **Site**, in transit or in temporary storage. Policies shall name the **Contractor** as Named Insured and list the **City** as both an Additional Insuredand a Loss Payee as its interest may appear.

22.1.4(a) Policies of such insurance shall specify that, in the event a loss occurs at an occupied facility, occupancy of such facility is permitted without the consent of the issuing insurance company.

22.1.4(b) Such insurance may be provided through an Installation Floater, at the **Contractor's** option, if it otherwise conforms with the requirements of this Article 22.1.4.

22.1.5 Commercial Automobile Liability Insurance: The **Contractor** shall provide Commercial Automobile Liability Insurance for liability arising out of ownership, maintenance or use of any owned (if any), non-owned and hired vehicles to be used in connection with this **Contract**. Coverage shall be at least as broad as the latest edition of ISO Form CA0001. If vehicles are used for transporting hazardous materials, the Automobile Liability Insurance shall be endorsed to provide pollution liability broadened coverage for covered vehicles (endorsement CA 99 48) as well as proof of MCS 90.

22.1.6 Contractors Pollution Liability Insurance: If specified in Schedule A of the General Conditions, the **Contractor** shall maintain, or cause the **Subcontractor** doing such **Work**to maintain, Contractors Pollution Liability Insurance covering bodily injury and property damage. Such insurance shall provide coverage for actual, alleged or threatened emission, discharge, dispersal, seepage, release or escape of pollutants (including asbestos), including any loss, cost or expense incurred as a result of any cleanup of pollutants (including asbestos) or in the investigation, settlement or defense of any claim, action, or proceedings arising from the operations under this **Contract**. Such insurance shall be in the **Contractor's** name and list the **City** as an Additional Insured and any other entity specified in Schedule A. Coverage shall include, without limitation, (a) loss of use of damaged property or of property that has not been physically injured, (b) transportation, and (c) non- owned disposal sites.

22.1.6(a) Coverage for the **City** as Additional Insured shall specifically include the **City's** officials and employees and be at least as broad as provided to the **Contractor** for this **Project**.

22.1.6(b) If such insurance is written on a claims-made policy, such policy shall have a retroactive date on or before the effective date of this **Contract**, and continuous coverage shall be maintained, or an extended discovery period exercised, for a period of not less than three (3) years from the time the **Work** under this **Contract** is completed.

22.1.7 Marine Insurance:

22.1.7(a) Marine Protection and Indemnity Insurance: If specified in Schedule A of the General Conditions or if the **Contractor** engages in marine operations in the execution of any part of the **Work**, the **Contractor** shall maintain, or cause the**Subcontractor** doing such Work to maintain, Marine Protection and Indemnity Insurance with coverage at least as broad as Form SP-23. The insurance shall provide coverage for the **Contractor** or **Subcontractor** (whichever is doing this **Work**) and for the **City** (together with its officials and employees) and any other entity specified in Schedule A as an Additional Insured for bodily injury and property damage arising from marine operations under this

Contract. Coverage shall include, without limitation, injury or death of crew members (if not fully provided through other insurance), removal of wreck, damage to piers, wharves and other fixed or floating objects and loss of or damage to any other vessel or craft, or to property on such other vessel or craft.

22.1.7(b) Hull and Machinery Insurance: If specified in Schedule A of the General Conditions or if the **Contractor** engages in marine operations in the execution of any part of the **Work**, the **Contractor** shall maintain, or cause the **Subcontractor** doing such **Work** to maintain, Hull and Machinery Insurance with coverage for the **Contractor** or **Subcontractor** (whichever is doing this Work) and for the **City** (together with its officials and employees) as Additional Insured at least as broad as the latest edition of American Institute Tug Form for all tugs used under this **Contract** and Collision Liability at least as broad as the latest edition of American Institute Hull Clauses.

22.1.7(c) Marine Pollution Liability Insurance: If specified in Schedule A of the General Conditions or if the **Contractor** engages in marine operations in the execution of any part of the **Work**, the **Contractor** shall maintain, or cause the **Subcontractor** doing such Work to maintain, Marine Pollution Liability Insurance covering itself (or the Subcontractor doing such Work) as Named Insured and the **City** (together with its officials and employees) and any other entity specified in Schedule A as an Additional Insured. Coverage shall be at least as broad as that provided by the latest edition of Water Quality Insurance Syndicate Form and include, without limitation, liability arising from the discharge or substantial threat of a discharge of oil, or from the release or threatened release of a hazardous substance including injury to, or economic losses resulting from, the destruction of or damage to real property, personal property or natural resources.

22.1.8 The **Contractor** shall provide such other types of insurance, at such minimum limits and with such conditions, as are specified in Schedule A of the General Conditions.

22.2 General Requirements for Insurance Coverage and Policies:

22.2.1 All required insurance policies shall be maintained with companies that may lawfully issue the required policy and have an A.M. Best rating of at least A-/VII or a Standard and Poor's rating of at least A, unless prior written approval is obtained from the **City** Corporation Counsel.

22.2.2 The **Contractor** shall be solely responsible for the payment of all premiums for all required policies and all deductibles and self-insured retentions to which such policies are subject, whether or not the **City** is an insured under the policy.

22.2.3 In his/her sole discretion, the **Commissioner** may, subject to the approval of the **Comptroller** and the **City** Corporation Counsel, accept Letters of Credit and/or custodial accounts in lieu of required insurance.

22.2.4 The **City's** limits of coverage for all types of insurance required pursuant to Schedule A of the General Conditions shall be the greater of (i) the minimum limits set forth in Schedule A or (ii) the limits provided to the **Contractor** as Named Insured under all primary, excess, and umbrella policies of that type of coverage.

22.2.5 The **Contractor** may satisfy its insurance obligations under this Article 22 through primary policies or a combination of primary and excess/umbrella policies, so long as all policies provide the scope of coverage required herein.

22.2.6 Policies of insurance provided pursuant to this Article 22 shall be primary and non-contributing to any insurance or self-insurance maintained by the **City**.

22.3 Proof of Insurance:

22.3.1 For all types of insurance required by Article 22.1 and Schedule A, except for insurance required by Articles 22.1.4 and 22.1.7, the **Contractor** shall file proof of insurance in accordance with this Article 22.3 within ten (10) **Days** of award. For insurance provided pursuant to Articles 22.1.4 and 22.1.7, proof shall be filed by a date specified by the **Commissioner** or ten (10) **Days** prior to the commencement of the portion of the **Work** covered by such policy, whichever is earlier.

22.3.2 For Workers' Compensation Insurance provided pursuant to Article 22.1.2, the **Contractor** shall submit one of the following forms: C-105.2 Certificate of Workers' Compensation Insurance; U-26.3 - State Insurance Fund Certificate of Workers' Compensation Insurance; Request for WC/DB Exemption (Form CE-200); equivalent or successor forms used by the New York State Workers' Compensation Board; or other proof of insurance in a form acceptable to the **Commissioner**. For Disability Benefits Insurance provided pursuant to Article 22.1.2, the Contractor shall submit DB-120.1 - Certificate Of Insurance Coverage Under The NYS Disability Benefits Law, Request for WC/DB Exemption (Form CE-200); equivalent or successor forms used by the New York State Workers' Compensation Board; or other proof of insurance in a form acceptable to the **Commissioner**. ACORD forms are not acceptable.

22.3.3 For policies provided pursuant to all of Article 22.1 other than Article 22.1.2, the **Contractor** shall submit one or more Certificates of Insurance on forms acceptable to the **Commissioner**. All such Certificates of Insurance shall certify (a) the issuance and effectiveness of such policies of insurance, each with the specified minimum limits (b) for insurance secured pursuant to Article 22.1.1 that the **City** and any other entity specified in Schedule A is an Additional Insured thereunder; (c) in the event insurance is required pursuant to Article 22.1.6 and/or Article 22.1.7, that the City is an Additional Insured thereunder; (d) the company code issued to the insurance company by the National Association of Insurance Commissioners (the NAIC number); and (e) the number assigned to the **Contract** by the **City**. All such Certificates of Insurance shall be accompanied by either a duly executed "Certification by Insurance Broker or Agent" in the form contained in Part III of Schedule A or copies of all policies referenced in such Certificate of Insurance as certified by an authorized representative of the issuing insurance carrier. If any policy is not available at the time of submission, certified binders may be submitted until such time as the policy is available, at which time a certified copy of the policy shall be submitted.

22.3.4 Documentation confirming renewals of insurance shall be submitted to the **Commissioner** prior to the expiration date of coverage of policies required under this **Contract**. Such proofs of insurance shall comply with the requirements of Articles 22.3.2 and 22.3.3.

22.3.5 The **Contractor** shall be obligated to provide the **City** with a copy of any policy of insurance provided pursuant to this Article 22 upon the demand for such policy by the **Commissioner** or the **City** Corporation Counsel.

22.4 Operations of the **Contractor**:

22.4.1 The **Contractor** shall not commence the **Work** unless and until all required certificates have been submitted to and accepted by the **Commissioner**. Acceptance by the

Commissioner of a certificate does not excuse the **Contractor** from securing insurance consistent with all provisions of this Article 22 or of any liability arising from its failure todo so.

22.4.2 The **Contractor** shall be responsible for providing continuous insurance coverage in the manner, form, and limits required by this **Contract** and shall be authorized to perform **Work** only during the effective period of all required coverage.

22.4.3 In the event that any of the required insurance policies lapse, are revoked, suspended or otherwise terminated, for whatever cause, the **Contractor** shall immediately stop all **Work**, and shall not recommence **Work** until authorized in writing to do so by the **Commissioner**. Upon quitting the **Site**, except as otherwise directed by the **Commissioner**, the **Contractor** shall leave all plant, materials, equipment, tools, and supplies on the **Site**. **Contract** time shall continue to run during such periods and no extensions of time will be granted. The **Commissioner** may also declare the **Contractor** in default for failure to maintain required insurance.

22.4.4 In the event the **Contractor** receives notice, from an insurance company or other person, that any insurance policy required under this Article 22 shall be cancelled or terminated (or has been cancelled or terminated) for any reason, the **Contractor** shall immediately forward a copy of such notice to both the **Commissioner** and the New York City Comptroller, attn: Office of Contract Administration, Municipal Building, One Centre Street, room 1005, New York, New York 10007. Notwithstanding the foregoing, the**Contractor** shall ensure that there is no interruption in any of the insurance coverage required under this Article 22.

22.4.5 Where notice of loss, damage, occurrence, accident, claim or suit is required under an insurance policy maintained in accordance with this Article 22, the **Contractor** shall notify in writing all insurance carriers that issued potentially responsive policies of any such event relating to any operations under this **Contract** (including notice to Commercial General Liability insurance carriers for events relating to the **Contractor**'s own employees) no later than 20 days after such event. For any policy where the **City** is an Additional Insured, such notice shall expressly specify that "this notice is being given on behalf of the City of New York as Insured as well as the Named Insured." Such notice shall also contain the following information: the number of the insurance policy, the name of the named insured, the date and location of the damage, occurrence, or accident, and the identity of the persons or things injured, damaged or lost. The **Contractor** shall simultaneously send a copy of such notice to the City of New York c/o Insurance Claims Specialist, Affirmative Litigation Division, New York City Law Department, 100 Church Street, New York, New York 10007.

22.4.6 In the event of any loss, accident, claim, action, or other event that does or can give rise to a claim under any insurance policy required under this Article 22, the **Contractor** shall at all times fully cooperate with the **City** with regard to such potential or actual claim.

22.5 **Subcontractor** Insurance: In the event the **Contractor** requires any **Subcontractor** to procure insurance with regard to any operations under this **Contract** and requires such **Subcontractor** to name the **Contractor** as an **Additional Insured** thereunder, the **Contractor** shall ensure that the **Subcontractor** name the **City**, including its officials and employees, as an Additional Insured with coverage at least as broad as the most recent edition of ISO Form CG 20 26.

22.6 Wherever reference is made in Article 7 or this Article 22 to documents to be sent to the **Commissioner** (e.g., notices, filings, or submissions), such documents shall be sent to the address set forth in Schedule A of the General Conditions. In the event no address is set forth in Schedule A, such documents

are to be sent to the **Commissioner's** address as provided elsewhere in this **Contract**.

22.7 Apart from damages or losses covered by insurance provided pursuant to Articles 22.1.2, 22.1.3, or 22.1.5, the **Contractor** waives all rights against the **City**, including its officials and employees, for any damages or losses that are covered under any insurance required under this Article 22 (whether or not such insurance is actually procured or claims are paid thereunder) or any other insurance applicableto the operations of the **Contractor** and/or its employees, agents, or **Subcontractors**.

22.8 In the event the **Contractor** utilizes a self-insurance program to satisfy any of the requirements of this Article 22, the **Contractor** shall ensure that any such self-insurance program provides the **City** with all rights that would be provided by traditional insurance under this Article 22, including but not limited to the defense and indemnification obligations that insurers are required to undertake in liability policies.

22.9 Materiality/Non-Waiver: The **Contractor's** failure to secure policies in complete conformity with this Article 22, or to give an insurance company timely notice of any sort required in this **Contract** or to do anything else required by this Article 22 shall constitute a material breach of this **Contract**. Such breach shall not be waived or otherwise excused by any action or inaction by the **City** at any time.

22.10 Pursuant to General Municipal Law Section 108, this **Contract** shall be void and of no effect unless **Contractor** maintains Workers' Compensation Insurance for the term of this **Contract** tothe extent required and in compliance with the New York State Workers' Compensation Law.

22.11 Other Remedies: Insurance coverage provided pursuant to this Article 22 or otherwise shall not relieve the **Contractor** of any liability under this **Contract**, nor shall it preclude the **City** from exercising any rights or taking such other actions available to it under any other provisions of this **Contract** or **Law**.

ARTICLE 23. MONEY RETAINED AGAINST CLAIMS

23.1 If any claim shall be made by any person or entity (including **Other Contractors** with the **City** on this **Project**) against the **City** or against the **Contractor** and the **City** for any of the following:

(a) An alleged loss, damage, injury, theft or vandalism of any of the kinds referred to in Articles 7 and 12, plus the reasonable costs of defending the **City**, which in the opinion of the **Comptroller** may not be paid by an insurance company (for any reason whatsoever);or

(b) An infringement of copyrights, patents or use of patented articles, tools, etc., asreferred to in Article 57; or

(c) Damage claimed to have been caused directly or indirectly by the failure of the **Contractor** to perform the **Work** in strict accordance with this **Contract,**

the amount of such claim, or so much thereof as the **Comptroller** may deem necessary, may be withheld by the **Comptroller**, as security against such claim, from any money due hereunder. The **Comptroller**, in his/her discretion, may permit the **Contractor** to substitute other satisfactory security in lieu of the monies so withheld.

23.2 If an action on such claim is timely commenced and the liability of the **City**, or the **Contractor**,

or both, shall have been established therein by a final judgment of a court of competent jurisdiction, or if such claim shall have been admitted by the **Contractor** to be valid, the **Comptroller** shall pay such judgment or admitted claim out of the monies retained by the **Comptroller** under the provisions of this Article 23, and return the balance, if any, without interest, to the **Contractor**.

ARTICLE 24. MAINTENANCE AND GUARANTY

24.1 The **Contractor** shall promptly repair, replace, restore or rebuild, as the **Commissioner** may determine, any finished **Work** in which defects of materials or workmanship may appear or to which damage may occur because of such defects, during the one (1) year period subsequent to the date of **Substantial Completion** (or use and occupancy in accordance with Article 16), except where other periods of maintenance and guaranty are provided for in Schedule A.

24.2 As security for the faithful performance of its obligations hereunder, the **Contractor**, upon filing its requisition for payment on **Substantial Completion**, shall deposit with the **Commissioner** a sum equal to one (1%) percent of the price (or the amount fixed in Schedule A of the General Conditions) in cash or certified check upon a state or national bank and trust company or a check of such bank and trust company signed by a duly authorized officer thereof and drawn to the order of the **Comptroller**, or obligations of the **City**, which the **Comptroller** may approve as of equal value with the sum so required.

24.3 In lieu of the above, the **Contractor** may make such security payment to the **City** byauthorizing the **Commissioner** in writing to deduct the amount from the **Substantial Completion** payment which shall be deemed the deposit required above.

24.4 If the **Contractor** has faithfully performed all of its obligations hereunder the **Commissioner** shall so certify to the **Comptroller** within five (5) **Days** after the expiration of one (1) year from the date of **Substantial Completion** and acceptance of the **Work** or within thirty (30) **Days** after the expirationof the guarantee period fixed in the **Specifications**. The security payment shall be repaid to the **Contractor** without interest within thirty (30) **Days** after certification by the **Commissioner** to the **Comptroller** that the **Contractor** has faithfully performed all of its obligations hereunder.

24.5 Notice by the **Commissioner** to the **Contractor** to repair, replace, rebuild or restore such defective or damaged **Work** shall be timely, pursuant to this article, if given not later than ten (10) **Days** subsequent to the expiration of the one (1) year period or other periods provided for herein.

24.6 If the **Contractor** shall fail to repair, replace, rebuild or restore such defective or damaged **Work** promptly after receiving such notice, the **Commissioner** shall have the right to have the **Work** done by others in the same manner as provided for in the completion of a defaulted **Contract**, under Article 51.

24.7 If the security payment so deposited is insufficient to cover the cost of such **Work**, the **Contractor** shall be liable to pay such deficiency on demand by the **Commissioner**.

24.8 The **Engineer's** certificate setting forth the fair and reasonable cost of repairing, replacing, rebuilding or restoring any damaged or defective **Work** when performed by one other than the **Contractor**, shall be binding and conclusive upon the **Contractor** as to the amount thereof.

24.9 The **Contractor** shall obtain all manufacturers' warranties and guaranties of all equipment and materials required by this **Contract** in the name of the **City** and shall deliver same to the **Commissioner**. All of the **City's** rights and title and interest in and to said manufacturers' warranties and guaranties may be assigned by the **City** to any subsequent purchasers of such equipment and materials or lessees of the

premises into which the equipment and materials have been installed.

CHAPTER VI: CHANGES, EXTRA WORK, AND DOCUMENTATION OF CLAIM

ARTICLE 25. CHANGES

25.1 Changes may be made to this **Contract** only as duly authorized in writing by the **Commissioner** in accordance with the **Law** and this **Contract**. All such changes, modifications, and amendments will become a part of the **Contract**. **Work** so ordered shall be performed by the **Contractor**.

25.2 **Contract** changes will be made only for **Work** necessary to complete the **Work** included inthe original scope of the **Contract** and/or for non-material changes to the scope of the **Contract**.Changes are not permitted for any material alteration in the scope of **Work** in the **Contract**.

25.3 The **Contractor** shall be entitled to a price adjustment for **Extra Work** performed pursuant toa written change order. Adjustments to price shall be computed in one or more of the following ways:

25.3.1 By applicable unit prices specified in the **Contract**; and/or

25.3.2 By agreement of a fixed price; and/or

25.3.3 By time and material records; and/or

25.3.4 In any other manner approved by the **CCPO**.

25.4 All payments for change orders are subject to pre-audit by the **Engineering Audit Officer** and may be post-audited by the **Comptroller** and/or the **Agency**.

ARTICLE 26. METHODS OF PAYMENT FOR OVERRUNS AND EXTRA WORK

26.1 Overrun of Unit Price Item: An overrun is any quantity of a unit price item which the **Contractor** is directed to provide which is in excess of one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid schedule.

26.1.1 For any unit price item, the **Contractor** will be paid at the unit price bid for any quantity up to one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid schedule. If during the progress of the **Work**, the actual quantity of any unit price item required to complete the **Work** approaches the estimated quantity forthat item, and for any reason it appears that the actual quantity of any unit price item necessary to complete the **Work** will exceed the estimated quantity for that item by twenty- five (25%) percent, the **Contractor** shall immediately notify the **Engineer** of such anticipated overrun. The **Contractor** shall not be compensated for any quantity of a unit price item provided which is in excess of one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid schedule without written authorization from the **Engineer**.

26.1.2 If the actual quantity of any unit price item necessary to complete the **Work** will exceed one hundred twenty five (125%) percent of the estimated quantity for that item set forth in the bid schedule, the **City** reserves the right and the **Contractor** agrees to negotiate a new unit price for such item. In no event shall such negotiated new unit price exceed the unit bid price. If the **City** and **Contractor** cannot agree on a new unit price, then the **City** shall order the **Contractor** and the **Contractor** agrees to provide additional quantities of the item on the

basis of time and material records for the actual and reasonable cost as determined under Article 26.2, but in no event at a unit price exceeding the unit price bid.

26.2 **Extra Work:** For **Extra Work** where payment is by agreement on a fixed price in accordance with Article 25.3.2, the price to be paid for such **Extra Work** shall be based on the fair and reasonable estimated cost of the items set forth below. For **Extra Work** where payment is based on time and material records in accordance with Article 25.3.3, the price to be paid for such **Extra Work** shall be the actual and reasonable cost of the items set forth below, calculated in accordance with the formula specified therein, if any.

26.2.1 Necessary materials (including transportation to the **Site**); plus

26.2.2 Necessary direct labor, including payroll taxes (subject to statutory wage caps) and supplemental benefits; plus

26.2.3 Sales and personal property taxes, if any, required to be paid on materials not incorporated into such **Extra Work**; plus

26.2.4 Reasonable rental value of **Contractor**-owned (or **Subcontractor**-owned, as applicable), necessary plant and equipment other than **Small Tools**, plus fuel/energy costs. Except for fuel costs for pick-up trucks which shall be reimbursed based on a consumption of five (5) gallons per shift, fuel costs shall be reimbursed based on actual costs or, in the absence of auditable documentation, the following fuel consumption formula per operating hour: (.035) x (HP rating) x (Fuel cost/gallon). Reasonable rental value is defined as the lower of either seventy-five percent of the monthly prorated rental rates established in "The AED Green Book, Rental Rates and Specifications for Construction Equipment" published by Equipment Watch (the "Green Book"), or seventy-five percent of the monthly prorated rental rates established in the "Rental Rate Blue Book for Construction Equipment" published by Equipment Watch (the "Blue Book") (the applicable Blue Book rate being for rental only without the addition of any operational costs listed in the Blue Book). The reasonable rental value is deemed to be inclusive of all operating costs except for fuel/energy consumption and equipment operator's wages/costs. For multiple shift utilization, reimbursement shall be calculated as follows: first shift shall be seventy-five (75%) percent of such rental rates; second shift shall be sixty (60%) percent of the first shift rate; and third shift shall be forty (40%) percent of the first shift rate. Equipment on standby shall be reimbursed at one-third (1/3) the prorated monthly rental rate. **Contractor**-owned (or **Subcontractor**-owned, as applicable) equipment includes equipment from rental companies affiliated with or controlled by the **Contractor** (or **Subcontractor**, as applicable)**,** as determined by the **Commissioner**. In establishing cost reimbursement for non-operating **Contractor**-owned (or **Subcontractor**-owned, as applicable) equipment (scaffolding, sheeting systems, road plates, etc.), the **City** may restrict reimbursement to a purchase-salvage/life cycle basis if less than the computed rental costs; plus

26.2.5 Necessary installation and dismantling of such plant and equipment, including transportation to and from the **Site**, if any, provided that, in the case of non-**Contractor**-owned (or non-**Subcontractor**-owned, as applicable) equipment rented from a third party, the cost of installation and dismantling are not allowable if such costs are included in the rental rate; plus

26.2.6 Necessary fees charged by governmental entities; plus

26.2.7 Necessary construction-related service fees charged by non-governmental entities, such as landfill tipping fees; plus

26.2.8 Reasonable rental costs of non-**Contractor**-owned (or non-**Subcontractor**-owned, as applicable) necessary plant and equipment other than **Small Tools**, plus fuel/energy costs. Except for fuel costs for pick-up trucks which shall be reimbursed based on a consumption of five (5) gallons per shift, fuel costs shall be reimbursed based on actual costs or, in the absence of auditable documentation, the following fuel consumption formula per hour of operation: (.035) x (HP rating) x (Fuel cost/gallon). In lieu of renting, the **City** reserves the right to direct the purchase of non-operating equipment (scaffolding, sheeting systems, road plates, etc.), with payment on a purchase-salvage/life cycle basis, if less than the projected rental costs; plus

26.2.9 Workers' Compensation Insurance, and any insurance coverage expressly required by the **City** for the performance of the **Extra Work** which is different than the types of insurance required by Article 22 and Schedule A of the General Conditions. The cost of Workers' Compensation Insurance is subject to applicable payroll limitation caps and shall be based upon the carrier's Manual Rate for such insurance derived from the applicable class Loss Cost ("LC") and carrier's Lost Cost Multiplier ("LCM") approved by the New York State Department of Financial Services, and with the exception of experience rating, rate modifiers as promulgated by the New York Compensation Insurance Rating Board ("NYCIRB"); plus

26.2.10 Additional costs incurred as a result of the **Extra Work** for performance and payment bonds; plus

26.2.11 Twelve percent (12%) percent of the total of items in Articles 26.2.1 through 26.2.5 as compensation for overhead, except that no percentage for overhead will be allowed on **Payroll Taxes** or on the premium portion of overtime pay or on sales and personal property taxes. Overhead shall include without limitation, all costs and expenses in connection with administration, management superintendence, small tools, and insurance required by Schedule A of the General Conditions other than Workers' Compensation Insurance; plus

26.2.12 Ten (10%) percent of the total of items in Articles 26.2.1 through 26.2.5, plus the items in Article 26.2.11, as compensation for profit, except that no percentage for profit will be allowed on **Payroll Taxes** or on the premium portion of overtime pay or on sales and personal property taxes; plus

26.2.13 Five (5%) percent of the total of items in Articles 26.2.6 through 26.2.10 as compensation for overhead and profit.

26.3 Where the **Extra Work** is performed in whole or in part by other than the **Contractor's** own forces pursuant to Article 26.2, the **Contractor** shall be paid, subject to pre-audit by the **Engineering Audit Officer**, the cost of such **Work** computed in accordance with Article 26.2 above, plus an additional allowance of five (5%) percent to cover the **Contractor's** overhead and profit.

26.4 Where a change is ordered, involving both **Extra Work** and omitted or reduced **Contract Work,** the **Contract** price shall be adjusted, subject to pre-audit by the **EAO**, in an amount based on the difference between the cost of such **Extra Work** and of the omitted or reduced **Work**.

26.5 Where the **Contractor** and the **Commissioner** can agree upon a fixed price for **Extra Work** in accordance with Article 25.3.2 or another method of payment for **Extra Work** in accordance with Article 25.3.4, or for **Extra Work** ordered in connection with omitted **Work**, such method, subject to pre-audit by the **EAO**, may, at the option of the **Commissioner**, be substituted for the cost plus a percentage method provided in Article 26.2; provided, however, that if the **Extra Work** is performed by a **Subcontractor**, the **Contractor** shall not be entitled to receive more than an additional allowance of five (5%) percent for overhead and profit over

the cost of such **Subcontractor's Work** as computed in accordance with Article 26.2.

ARTICLE 27. RESOLUTION OF DISPUTES

27.1 All disputes between the **City** and the **Contractor** of the kind delineated in this Article 27.1 that arise under, or by virtue of, this **Contract** shall be finally resolved in accordance with the provisions of this Article 27 and the **PPB** Rules. This procedure for resolving all disputes of the kind delineated herein shall be the exclusive means of resolving any such disputes.

27.1.1 This Article 27 shall not apply to disputes concerning matters dealt with in other sections of the **PPB** Rules, or to disputes involving patents, copyrights, trademarks, or trade secrets (as interpreted by the courts of New York State) relating to proprietary rights in computer software.

27.1.2 This Article 27 shall apply only to disputes about the scope of **Work** delineated by the **Contract**, the interpretation of **Contract** documents, the amount to be paid for **Extra Work** or disputed work performed in connection with the **Contract**, the conformity of the **Contractor's Work** to the **Contract**, and the acceptability and quality of the **Contractor's Work**; such disputes arise when the **Engineer**, **Resident Engineer**, **Engineering Audit Officer**, or other designee of the **Commissioner** makes a determination with which the **Contractor** disagrees.

27.2 All determinations required by this Article 27 shall be made in writing clearly stated, with a reasoned explanation for the determination based on the information and evidence presented to the party making the determination. Failure to make such determination within the time required by this Article 27 shall be deemed a non-determination without prejudice that will allow application to the next level.

27.3 During such time as any dispute is being presented, heard, and considered pursuant to this Article 27, the **Contract** terms shall remain in force and the **Contractor** shall continue to perform **Work** as directed by the **ACCO** or the **Engineer**. Failure of the **Contractor** to continue **Work** as directed shall constitute a waiver by the **Contractor** of its claim.

27.4 Presentation of Disputes to **Commissioner**.

Notice of Dispute and Agency Response. The **Contractor** shall present its dispute in writing ("Notice of Dispute") to the **Commissioner** within thirty (30) Days of receiving written notice of the determination or action that is the subject of the dispute. This notice requirement shall not be read to replace any other notice requirements contained in the **Contract**. The Notice of Dispute shall include all the facts, evidence, documents, or other basis upon which the **Contractor** relies in support of its position, as well as a detailed computation demonstrating how any amount of money claimed by the **Contractor** inthe dispute was arrived at. Within thirty (30) Days after receipt of the detailed written submission comprising the complete Notice of Dispute, the **Engineer**, **Resident Engineer**, **Engineering Audit Officer**, or other designee of the **Commissioner** shall submit to the **Commissioner** all materials he or she deems pertinent to the dispute. Following initial submissions to the **Commissioner**, either party may demand of the other the production of any document or other material the demanding party believes may be relevant to the dispute. The requested party shall produce all relevant materials that are not otherwise protected by a legal privilege recognized by the courts of New York State. Any question of relevancy shall be determined by the **Commissioner** whose decision shall be final. Willful failure of the **Contractor** to produce any requested material whose relevancy the **Contractor** has not disputed, or whose relevancy has been affirmatively determined, shall constitute a waiver by the **Contractor** of its claim.

27.4.1 **Commissioner** Inquiry. The **Commissioner** shall examine the material and may, in his or her discretion, convene an informal conference with the **Contractor**, the **ACCO**, and the **Engineer**, **Resident Engineer**, **Engineering Audit Officer**, or other designee of the **Commissioner** to resolve the issue by mutual consent prior to reaching a determination. The **Commissioner** may seek such technical or other expertise as he or she shall deem appropriate, including the use of neutral mediators, and require any such additional material from either or both parties as he or she deems fit. The **Commissioner's** ability to render, and the effect of, a decision hereunder shall not be impaired by any negotiations in connection with the dispute presented, whether or not the **Commissioner** participated therein. The **Commissioner** may or, at the request of any party to the dispute, shall compel the participation of any **Other Contractor** with a contract related to the **Work** of this **Contract**, and that **Contractor** shall be bound by the decision of the **Commissioner**. Any **Other Contractor** thus brought into the dispute resolution proceeding shall have the same rights and obligations under this Article 27 as the **Contractor** initiating the dispute.

27.4.2 **Commissioner** Determination. Within thirty (30) **Days** after the receipt of all materials and information, or such longer time as may be agreed to by the parties, the **Commissioner** shall make his or her determination and shall deliver or send a copy of such determination to the **Contractor**, the **ACCO,** and **Engineer**, **Resident Engineer**,**Engineering Audit Officer**, or other designee of the **Commissioner**, as applicable, together with a statement concerning how the decision may be appealed.

27.4.3 Finality of **Commissioner's** Decision. The **Commissioner's** decision shall be final and binding on all parties, unless presented to the Contract Dispute Resolution Board pursuant to this Article 27. The **City** may not take a petition to the Contract Dispute Resolution Board. However, should the **Contractor** take such a petition, the **City** may seek, and the Contract Dispute Resolution Board may render, a determination less favorable to the **Contractor** and more favorable to the **City** than the decision of the **Commissioner**.

27.5 Presentation of Dispute to the **Comptroller**. Before any dispute may be brought by the **Contractor** to the Contract Dispute Resolution Board, the **Contractor** must first present its claim to the **Comptroller** for his or her review, investigation, and possible adjustment.

27.5.1 Time, Form, and Content of Notice. Within thirty (30) **Days** of its receipt of a decision by the **Commissioner,** the **Contractor** shall submit to the **Comptroller** and to the **Commissioner** a Notice of Claim regarding its dispute with the **Agency**. The Notice of Claim shall consist of (i) a brief written statement of the substance of the dispute, the amount of money, if any, claimed and the reason(s) the **Contractor** contends the dispute was wrongly decided by the **Commissioner**; (ii) a copy of the written decision of the **Commissioner**; and (iii) a copy of all materials submitted by the **Contractor** to the **Agency**, including the Notice of Dispute. The **Contractor** may not present to the **Comptroller** any material not presented to the **Commissioner**, except at the request of the **Comptroller**.

27.5.2 Response. Within thirty (30) **Days** of receipt of the Notice of Claim, the **Agency** shall make available to the **Comptroller** a copy of all material submitted by the **Agency** to the **Commissioner** in connection with the dispute. The **Agency** may not present to the **Comptroller** any material not presented to the **Commissioner** except at the request of the **Comptroller**.

27.5.3 **Comptroller** Investigation. The **Comptroller** may investigate the claim in dispute and, in the course of such investigation, may exercise all powers provided in Sections 7-201 and 7-203 of the Administrative Code. In addition, the **Comptroller** may demand of either party, and such party shall provide, whatever additional material the **Comptroller** deems pertinent to the claim, including original business records of the **Contractor**. Willful failure of the **Contractor** to produce within fifteen (15) **Days** any material requested by the **Comptroller** shall constitute a waiver by the **Contractor** of its claim. The **Comptroller** may also schedule an informal conference to be attended by the **Contractor**, **Agency** representatives, and any other personnel desired by the **Comptroller**.

27.5.4 Opportunity of **Comptroller** to Compromise or Adjust Claim. The **Comptroller** shall have forty-five (45) **Days** from his or her receipt of all materials referred to in Article 27.5.3 to investigate the disputed claim. The period for investigation and compromise may be further extended by agreement between the **Contractor** and the **Comptroller**, to a maximum of ninety (90) **Days** from the **Comptroller's** receipt of all materials. The **Contractor** may not present its petition to the Contract Dispute Resolution Board until the period for investigation and compromise delineated in this Article 27.5.4 has expired. In compromising or adjusting any claim hereunder, the **Comptroller** may not revise or disregard the terms of the **Contract** between the parties.

27.6 Contract Dispute Resolution Board. There shall be a Contract Dispute Resolution Board composed of:

27.6.1 The chief administrative law judge of the Office of Administrative Trials and Hearings (OATH) or his/her designated OATH administrative law judge, who shall act as chairperson, and may adopt operational procedures and issue such orders consistent with this Article 27 as may be necessary in the execution of the Contract Dispute Resolution Board's functions, including, but not limited to, granting extensions of time to present or respond to submissions;

27.6.2 The **CCPO** or his/her designee; any designee shall have the requisite background to consider and resolve the merits of the dispute and shall not have participated personally and substantially in the particular matter that is the subject of the dispute or report to anyone who so participated; and

27.6.3 A person with appropriate expertise who is not an employee of the **City**. This person shall be selected by the presiding administrative law judge from a prequalified panel of individuals, established and administered by OATH with appropriate background to act as decision-makers in a dispute. Such individual may not have a contract or dispute with the **City** or be an officer or employee of any company or organization that does, or regularly represents persons, companies, or organizations having disputes with the **City**.

27.7 Petition to the Contract Dispute Resolution Board. In the event the claim has not been settled or adjusted by the **Comptroller** within the period provided in this Article 27, the **Contractor**, within thirty (30) **Days** thereafter, may petition the Contract Dispute Resolution Board to review the

Commissioner's determination.

27.7.1 Form and Content of Petition by **Contractor**. The **Contractor** shall present its dispute to the Contract Dispute Resolution Board in the form of a petition, which shall include (i) a brief written statement of the substance of the dispute, the amount of money, if any, claimed, and the reason(s) the **Contractor** contends the dispute was wrongly decided by the **Commissioner**; (ii) a copy of the written Decision of the **Commissioner,** (iii) copies of all materials submitted by the **Contractor** to the Agency; (iv) a copy of the written decision of the **Comptroller**, if any, and (v) copies of all correspondence with, or written material submitted by the **Contractor**, to the **Comptroller**. The **Contractor** shall concurrently submit four (4) complete sets of the Petition: one set to the **City** Corporation Counsel (Attn: Commercial and Real Estate Litigation Division) and three (3) sets to the Contract Dispute Resolution Board at OATH's offices with proof of service on the **City** Corporation Counsel. In addition, the **Contractor** shall submit a copy of the written statement of the substance of the dispute, cited in (i) above, to both the **Commissioner** and the **Comptroller**.

27.7.2 **Agency** Response. Within thirty (30) **Days** of its receipt of the Petition by the **City** Corporation Counsel, the **Agency** shall respond to the brief written statement of the **Contractor** and make available to the Contract Dispute Resolution Board all material it submitted to the **Commissioner** and **Comptroller**. Three (3) complete copies of the **Agency** response shall be provided to the Contract Dispute Resolution Board and one to the **Contractor**. Extensions of time for submittal of the **Agency** response shall be given as necessary upon a showing of good cause or, upon consent of the parties, for an initial period of up to thirty (30) Days.

27.7.3 Further Proceedings. The Contract Dispute Resolution Board shall permit the **Contractor** to present its case by submission of memoranda, briefs, and oral argument. The Contract Dispute Resolution Board shall also permit the **Agency** to present its case in response to the **Contractor** by submission of memoranda, briefs, and oral argument. If requested by the **City** Corporation Counsel, the **Comptroller** shall provide reasonable assistance in the preparation of the **Agency's** case. Neither the **Contractor** nor the **Agency** may support its case with any documentation or other material that was not considered by the **Comptroller**, unless requested by the Contract Dispute Resolution Board. The Contract Dispute Resolution Board, in its discretion, may seek such technical or other expert advice as it shall deem appropriate and may seek, on its own or upon application of a party, any such additional material from any party as it deems fit. The Contract Dispute Resolution Board, in its discretion, may combine more than one dispute between the parties for concurrent resolution.

27.7.4 Contract Dispute Resolution Board Determination. Within forty-five (45) **Days** of the conclusion of all written submissions and oral arguments, the Contract Dispute Resolution Board shall render a written decision resolving the dispute. In an unusually complex case, the Contract Dispute Resolution Board may render its decision in a longer period, not to exceed ninety (90) **Days**, and shall so advise the parties at the commencement of this period. The Contract Dispute Resolution Board's decision must be consistent with the terms of the **Contract**. Decisions of the Contract Dispute Resolution Board shall only resolve matters before the Contract Dispute Resolution Board and shall not have precedential effect with respect to matters not before the Contract Dispute Resolution Board.

27.7.5 Notification of Contract Dispute Resolution Board Decision. The Contract Dispute Resolution Board shall send a copy of its decision to the **Contractor**, the **ACCO**, the Engineer, the **Comptroller**, the **City** Corporation Counsel, the CCPO, and the **PPB**. A decision in favor of the **Contractor** shall be subject to the prompt payment provisions of the **PPB** Rules. The

Required Payment Date shall be thirty (30) Days after the date the parties are formally notified of the Contract Dispute Resolution Board's decision.

27.7.6 Finality of Contract Dispute Resolution Board Decision. The Contract Dispute Resolution Board's decision shall be final and binding on all parties. Any party may seek review of the Contract Dispute Resolution Board's decision solely in the form of a challenge, filed within four (4) months of the date of the Contract Dispute Resolution Board's decision, in a court of competent jurisdiction of the State of New York, County of New York pursuant to Article 78 of the Civil Practice Law and Rules. Such review by the court shall be limited to the question of whether or not the Contract Dispute Resolution Board's decision was made in violation of lawful procedure, was affected by an error of **Law**, or was arbitrary and capricious or an abuse of discretion. No evidence or information shall be introduced or relied upon in such proceeding that was not presented to the Contract Dispute Resolution Board in accordance with this Article 27.

27.8 Any termination, cancellation, or alleged breach of the **Contract** prior to or during the pendency of any proceedings pursuant to this Article 27 shall not affect or impair the ability of the **Commissioner** or Contract Dispute Resolution Board to make a binding and final decision pursuant to this Article 27.

ARTICLE 28. RECORD KEEPING FOR EXTRA OR DISPUTED WORK OR WORK ON ATIME & MATERIALS BASIS

28.1 While the **Contractor** or any of its **Subcontractors** is performing **Work** on a time and material basis or **Extra Work** on a time and material basis ordered by the **Commissioner** under Article 25, or where the **Contractor** believes that it or any of its **Subcontractors** is performing **Extra Work** but a final determination by **Agency** has not been made, or the **Contractor** or any of its **Subcontractors** is performing disputed **Work** (whether on or off the **Site**), or complying with a determination or order under protest in accordance with Articles 11, 27, and 30, in each such case the **Contractor** shall furnish the **Resident Engineer** daily with three (3) copies of written statements signed by the **Contractor's** representative at the **Site** showing:

28.1.1 The name, trade, and number of each worker employed on such **Work** or engaged in complying with such determination or order, the number of hours employed, and the character of the **Work** each is doing; and

28.1.2 The nature and quantity of any materials, plant and equipment furnished or used in connection with the performance of such **Work** or compliance with such determination or order, and from whom purchased or rented.

28.2 A copy of such statement will be countersigned by the **Resident Engineer**, noting thereon any items not agreed to or questioned, and will be returned to the **Contractor** within two (2) **Days** after submission.

28.3 The **Contractor** and its **Subcontractors**, when required by the **Commissioner**, or the **Comptroller**, shall also produce for inspection, at the office of the **Contractor** or **Subcontractor**, any and all of its books, bid documents, financial statements, vouchers, records, daily job diaries and reports, and cancelled checks, and any other documents relating to showing the nature and quantity of the labor, materials, plant and equipment actually used in the performance of such **Work**, or in complying with such determination or order, and the amounts expended therefor, and shall permit the **Commissioner** and the

Comptroller to make such extracts therefrom, or copies thereof, as they or either of them may desire.

28.4 In connection with the examination provided for herein, the **Commissioner**, upon demand therefor, will produce for inspection by the **Contractor** such records as the **Agency** may have withrespect to such **Extra Work** or disputed **Work** performed under protest pursuant to order of the **Commissioner**, except those records and reports which may have been prepared for the purpose of determining the accuracy and validity of the **Contractor's** claim.

28.5 Failure to comply strictly with these requirements shall constitute a waiver of any claim for extra compensation or damages on account of the performance of such **Work** or compliance with such determination or order.

ARTICLE 29. OMITTED WORK

29.1 If any **Contract Work** in a lump sum **Contract**, or if any part of a lump sum item in a unit price, lump sum, or percentage-bid **Contract** is omitted by the **Commissioner** pursuant to Article 33, the **Contract** price, subject to audit by the EAO, shall be reduced by a pro rata portion of the lump sum bid amount based upon the percent of **Work** omitted subject to Article 29.4. For the purpose of determining the pro rata portion of the lump sum bid amount, the bid breakdown submitted in accordance with Article 41 shall be considered, but shall not be the determining factor.

29.2 If the whole of a lump sum item or units of any other item is so omitted by the **Commissioner** in a unit price, lump sum, or percentage-bid **Contract**, then no payment will be made therefor except as provided in Article 29.4.

29.3 For units that have been ordered but are only partially completed, the unit price shall be reduced by a pro rata portion of the unit price bid based upon the percentage of **Work** omitted subject to Article 29.4.

29.4 In the event the **Contractor**, with respect to any omitted **Work**, has purchased any non-cancelable material and/or equipment that is not capable of use except in the performance of this **Contract** and has been specifically fabricated for the sole purpose of this **Contract**, but not yet incorporated into the **Work**, the **Contractor** shall be paid for such material and/or equipment in accordance with Article 64.2.1(b); provided, however, such payment is contingent upon the **Contractor's** delivery of such material and/or equipment in acceptable condition to a location designated by the **City**.

29.5 The **Contractor** agrees to make no claim for damages or for loss of overhead and profit with regard to any omitted **Work**.

ARTICLE 30. NOTICE AND DOCUMENTATION OF COSTS AND DAMAGES; PRODUCTION OF FINANCIAL RECORDS

30.1 If the **Contractor** shall claim to be sustaining damages by reason of any act or omission of the **City** or its agents, it shall submit to the **Commissioner** within forty-five (45) **Days** from the time such damages are first incurred, and every thirty (30) **Days** thereafter to the extent additional damages are being incurred for the same condition, verified statements of the details and the amounts of such damages, together with documentary evidence of such damages. The **Contractor** may submit any of the above statements within such additional time as may be granted by the **Commissioner** in writing upon written request therefor. Failure of the **Commissioner** to respond in writing to a written request for additional time within thirty (30) **Days** shall be deemed a denial of the request. On failure of the **Contractor** to strictly comply with

the foregoing provisions, such claims shall be deemed waived and no right to recover on such claims shall exist. Damages that the **Contractor** may claim in any action or dispute resolution procedure arising under or by reason of this **Contract** shall not be different from or in excess of the statements and documentation made pursuant to this Article 30. This Article 30.1 does not apply to claims submitted to the **Commissioner** pursuant to Article 11 or to claims disputing a determination under Article 27.

30.2 In addition to the foregoing statements, the **Contractor** shall, upon notice from the **Commissioner**, produce for examination at the **Contractor's** office, by the **Engineer**, **Architect** or **Project Manager**, all of its books of account, bills, invoices, payrolls, subcontracts, time books, daily reports, bank deposit books, bank statements, check books, and cancelled checks, showing all of its acts and transactions in connection with or relating to or arising by reason of this **Contract**, and submit itself and persons in its employment, for examination under oath by any person designated by the **Commissioner** or **Comptroller** to investigate claims made or disputes against the **City** under this **Contract**. At such examination, a duly authorized representative of the **Contractor** may be present.

30.3 In addition to the statements required under Article 28 and this Article 30, the **Contractor** and/or its **Subcontractor** shall, within thirty (30) **Days** upon notice from the **Commissioner** or **Comptroller**, produce for examination at the **Contractor's** and/or **Subcontractor's** office, by a representative of either the **Commissioner** or **Comptroller**, all of its books of account, bid documents, financial statements, accountant workpapers, bills, invoices, payrolls, subcontracts, time books, daily reports, bank deposit books, bank statements, check books, and cancelled checks, showing all of its acts and transactions in connection with or relating to or arising by reason of this **Contract**. Further, the **Contractor** and/or its **Subcontractor** shall submit any person in its employment, for examination under oath by any person designated by the **Commissioner** or **Comptroller** to investigate claims made or disputes against the **City** under this **Contract**. At such examination, a duly authorized representative of the **Contractor** may be present.

30.4 Unless the information and examination required under Article 30.3 is provided by the **Contractor** and/or its **Subcontractor** upon thirty (30) **Days'** notice from the **Commissioner** or **Comptroller**, or upon the **Commissioner's** or **Comptroller's** written authorization to extend the time to comply, the **City** shall be released from all claims arising under, relating to or by reason of this **Contract**, except for sums certified by the **Commissioner** to be due under the provisions of this **Contract**. It is further stipulated and agreed that no person has the power to waive any of the foregoing provisions and that in any action or dispute resolution procedure against the **City** to recover any sum in excess of the sums certified by the **Commissioner** to be due under or by reason of this **Contract**, the **Contractor** must allege in its complaint and prove, at trial or during such dispute resolution procedure, compliance with the provisions of this Article 30.

30.5 In addition, after the commencement of any action or dispute resolution procedure by the **Contractor** arising under or by reason of this **Contract**, the **City** shall have the right to require the **Contractor** to produce for examination under oath, up until the trial of the action or hearing before the Contract Dispute Resolution Board, the books and documents described in Article 30.3 and submit itself and all persons in its employ for examination under oath. If this Article 30 is not complied with as required, then the **Contractor** hereby consents to the dismissal of the action or dispute resolutionprocedure.

CHAPTER VII: POWERS OF THE RESIDENT ENGINEER, THE ENGINEER ORARCHITECT AND THE COMMISSIONER

ARTICLE 31. THE RESIDENT ENGINEER

31.1 The **Resident Engineer** shall have the power to inspect, supervise, and control the performance

of the **Work**, subject to review by the **Commissioner**. The **Resident Engineer** shall not, however, have the power to issue an **Extra Work** order, except as specifically designated in writing bythe **Commissioner**.

ARTICLE 32. THE ENGINEER OR ARCHITECT OR PROJECT MANAGER

32.1 The **Engineer** or **Architect** or **Project Manager**, in addition to those matters elsewhere herein delegated to the **Engineer** and expressly made subject to his/her determination, direction or approval, shall have the power, subject to review by the **Commissioner**:

32.1.1 To determine the amount, quality, and location of the **Work** to be paid for hereunder; and

32.1.2 To determine all questions in relation to the **Work**, to interpret the **Contract Drawings**, **Specifications**, and **Addenda**, and to resolve all patent inconsistencies or ambiguities therein; and

32.1.3 To determine how the **Work** of this **Contract** shall be coordinated with **Work** of **Other Contractors** engaged simultaneously on this **Project**, including the power to suspend any part of the **Work**, but not the whole thereof; and

32.1.4 To make minor changes in the **Work** as he/she deems necessary, provided such changes do not result in a net change in the cost to the **City** or to the **Contractor** of the **Work** to be done under the **Contract**; and

32.1.5 To amplify the **Contract Drawings**, add explanatory information and furnish additional **Specifications** and drawings, consistent with this **Contract**.

32.2 The foregoing enumeration shall not imply any limitation upon the power of the **Engineer** or **Architect** or **Project Manager**, for it is the intent of this **Contract** that all of the **Work** shall generally be subject to his/her determination, direction, and approval, except where the determination, direction or approval of someone other than the **Engineer** or **Architect** or **Project Manager** is expressly called for herein.

32.3 The **Engineer** or **Architect** or **Project Manager** shall not, however, have the power to issuean **Extra Work** order, except as specifically designated in writing by the **Commissioner**.

ARTICLE 33. THE COMMISSIONER

33.1 The **Commissioner**, in addition to those matters elsewhere herein expressly made subject to his/her determination, direction or approval, shall have the power:

33.1.1 To review and make determinations on any and all questions in relation to this **Contract** and its performance; and

33.1.2 To modify or change this **Contract** so as to require the performance of **Extra Work** (subject, however, to the limitations specified in Article 25) or the omission of **Contract Work**; and

33.1.3 To suspend the whole or any part of the **Work** whenever in his/her judgment such suspension is required:

33.1.3(a) In the interest of the **City** generally; or

33.1.3(b) To coordinate the **Work** of the various contractors engaged on this **Project** pursuant to the provisions of Article 12; or

33.1.3(c) To expedite the completion of the entire **Project** even though the completion of this particular **Contract** may thereby be delayed.

ARTICLE 34. NO ESTOPPEL

34.1 Neither the **City** nor any **Agency**, official, agent or employee thereof, shall be bound, precluded or estopped by any determination, decision, approval, order, letter, payment or certificate made or given under or in connection with this **Contract** by the **City**, the **Commissioner**, the **Engineer**, the **Resident Engineer**, or any other official, agent or employee of the **City**, either before or after the final completion and acceptance of the **Work** and payment therefor:

34.1.1 From showing the true and correct classification, amount, quality or character of the **Work** actually done; or that any such determination, decision, order, letter, payment or certificate was untrue, incorrect or improperly made in any particular, or that the **Work**, or any part thereof, does not in fact conform to the requirements of this **Contract**; and

34.1.2 From demanding and recovering from the **Contractor** any overpayment made to it, or such damages as the **City** may sustain by reason of the **Contractor's** failure to perform each and every part of its **Contract**.

CHAPTER VIII: LABOR PROVISIONS

ARTICLE 35. EMPLOYEES

35.1 The **Contractor** and its **Subcontractors** shall not employ on the **Work**:

35.1.1 Anyone who is not competent, faithful and skilled in the **Work** for which he/she shall be employed; and whenever the **Commissioner** shall inform the **Contractor**, in writing, that any employee is, in his/her opinion, incompetent, unfaithful or disobedient, that employee shall be discharged from the **Work** forthwith, and shall not again be employed upon it; or

35.1.2 Any labor, materials or means whose employment, or utilization during the course of this **Contract**, may tend to or in any way cause or result in strikes, work stoppages, delays, suspension of **Work** or similar troubles by workers employed by the **Contractor** or its **Subcontractors**, or by any of the trades working in or about the buildings and premises where **Work** is being performed under this **Contract**, or by **Other Contractors** or their **Subcontractors** pursuant to other contracts, or on any other building or premises owned or operated by the **City**, its **Agencies**, departments, boards or authorities. Any violation by the **Contractor** of this requirement may, upon certification of the **Commissioner**, be considered as proper and sufficient cause for declaring the **Contractor** to be in default, and for the **City** to take action against it as set forth in Chapter X of this **Contract**, or such other article of this **Contract** as the Commissioner may deem proper; or

35.1.3 In accordance with Section 220.3-e of the Labor Law of the State of New York (hereinafter "Labor Law"), the **Contractor** and its **Subcontractors** shall not employ on the **Work** any apprentice, unless he/she is a registered individual, under a bona fide program registered with the New York State Department of Labor. The allowable ratio of apprentices to journey-level workers in any craft classification shall not be greater than the ratio permitted to the **Contractor** as to its work force on any job under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered as above, shall be paid the wage rate determined by the **Comptroller** of the **City** for the classification of **Work** actually performed. The **Contractor** or **Subcontractor** will be required to furnish written evidence of the registration of its program and apprentices as well as all the appropriate ratios and wage rates, for the area of the construction prior to using any apprentices on the **Contract Work**.

35.2 If the total cost of the **Work** under this **Contract** is at least two hundred fifty thousand ($250,000) dollars, all laborers, workers, and mechanics employed in the performance of the C**ontract** on the public work site, either by the **Contractor**, **Subcontractor** or other person doing or contracting to do the whole or a part of the **Work** contemplated by the **Contract**, shall be certified prior to performing any **Work** as having successfully completed a course in construction safety and health approved by the United States Department of Labor's Occupational Safety and Health Administration that is at least ten (10) hours in duration.

35.3 In accordance with Local Law Nos. 30-2012 and 33-2012, codified at sections 6-132 and 12-113 of the Administrative Code, respectively,

35.3.1 The **Contractor** shall not take an adverse personnel action with respect to an officer or employee in retaliation for such officer or employee making a report of information concerning conduct which such officer or employee knows or reasonably believes to involve corruption, criminal activity, conflict of interest, gross mismanagement or abuse of authority by any officer or employee relating to this **Contract** to (a) the Commissioner of the Department of Investigation, (b) a member of the New York City Council, the Public Advocate, or the **Comptroller**, or (c) the **CCPO**, **ACCO**, **Agency** head, or **Commissioner**.

35.3.2 If any of the **Contractor**'s officers or employees believes that he or she has been the subject of an adverse personnel action in violation of Article 35.3.1, he or she shall be entitled to bring a cause of action against the **Contractor** to recover all relief necessary to make him or her whole. Such relief may include but is not limited to: (a) an injunction to restrain continued retaliation, (b) reinstatement to the position such employee would have had but for the retaliation or to an equivalent position, (c) reinstatement of full fringe benefits and seniority rights, (d) payment of two times back pay, plus interest, and (e) compensation for any special damages sustained as a result of the retaliation, including litigation costs and reasonable attorney's fees.

35.3.3 The **Contractor** shall post a notice provided by the **City** in a prominent and accessible place on any site where work pursuant to the **Contract** is performed that contains information about:

35.3.3(a) how its employees can report to the New York City Department of Investigation allegations of fraud, false claims, criminality or corruption arising outof or in connection with the **Contract**; and

35.3.3(b) the rights and remedies afforded to its employees under Administrative Code sections 7-805 (the New York City False Claims Act) and 12-113 (the Whistleblower Protection Expansion Act) for lawful acts taken in connection withthe

reporting of allegations of fraud, false claims, criminality or corruption in connection with the **Contract**.

35.3.4 For the purposes of this Article 35.3, "adverse personnel action" includes dismissal, demotion, suspension, disciplinary action, negative performance evaluation, any action resulting in loss of staff, office space, equipment or other benefit, failure to appoint, failure to promote, or any transfer or assignment or failure to transfer or assign against the wishes of the affected officer or employee.

35.3.5 This Article 35.3 is applicable to all of the **Contractor**'s **Subcontractors** having subcontracts with a value in excess of $100,000; accordingly, the **Contractor** shall include this rider in all subcontracts with a value a value in excess of $100,000.

35.4 Article 35.3 is not applicable to this **Contract** if it is valued at $100,000 or less. Articles 35.3.1, 35.3.2, 35.3.4, and 35.3.5 are not applicable to this **Contract** if it was solicited pursuant to a finding of an emergency.

35.5 Paid Sick Leave Law.

35.5.1 Introduction and General Provisions.

35.5.1(a) The Earned Sick Time Act, also known as the Paid Sick Leave Law ("PSLL"), requires covered employees who annually perform more than 80 hours of work in New York City to be provided with paid sick time[2]. Contractors of the **City** or of other governmental entities may be required to provide sick time pursuant to the PSLL.

35.5.1(b) The PSLL became effective on April 1, 2014, and is codified at Title 20, Chapter 8, of the New York City Administrative Code. It is administered by the City's Department of Consumer Affairs ("DCA"); DCA's rules promulgated under the PSLL are codified at Chapter 7 of Title 6 of the Rules of the City of New York ("Rules").

35.5.1(c) The **Contractor** agrees to comply in all respects with the PSLL and the Rules, and as amended, if applicable, in the performance of this **Contract**. The **Contractor** further acknowledges that such compliance is a material term of this **Contract** and that failure to comply with the PSLL in performance of this **Contract** may result in its termination.

35.5.1(d) The **Contractor** must notify the **Agency Chief Contracting Officer** of the **Agency** with whom it is contracting in writing within ten (10) days of receipt of a complaint (whether oral or written) regarding the PSLL involving the performance of this **Contract**. Additionally, the **Contractor** must cooperate with DCA's education efforts and must comply with DCA's subpoenas and other document demands as set forth in the PSLL and Rules.

35.5.1(e) The PSLL is summarized below for the convenience of the **Contractor**. The **Contractor** is advised to review the PSLL and Rules in their entirety. On the

[2] Pursuant to the PSLL, if fewer than five employees work for the same employer, as determined pursuant to New York City Administrative Code § 20-912(g), such employer has the option of providing such employees uncompensated sick time.

website www.nyc.gov/PaidSickLeave there are links to the PSLL and the associated Rules as well as additional resources for employers, such as Frequently Asked Questions, timekeeping tools and model forms, and an event calendar of upcoming presentations and webinars at which the **Contractor** can get more information about how to comply with the PSLL. The **Contractor** acknowledges that it is responsible for compliance with the PSLL notwithstanding any inconsistent language contained herein.

35.5.2 Pursuant to the PSLL and the Rules: Applicability, Accrual, and Use.

35.5.2(a) An employee who works within the City of New York for more than eighty hours in any consecutive 12-month period designated by the employer as its "calendar year" pursuant to the PSLL ("Year") must be provided sick time. Employers must provide a minimum of one hour of sick time for every 30 hours worked by an employee and compensation for such sick time must be provided at the greater of the employee's regular hourly rate or the minimum wage. Employers are not required to provide more than 40 hours of sick time to an employee in any Year.

35.5.2(b) An employee has the right to determine how much sick time he or she will use, provided that employers may set a reasonable minimum increment for the use of sick time not to exceed four hours per **Day**. In addition, an employee may carry over up to 40 hours of unused sick time to the following Year, provided that no employer is required to allow the use of more than forty hours of sick time in a Year or carry over unused paid sick time if the employee is paid for such unused sick time and the employer provides the employee with at least the legally required amount of paid sick time for such employee for the immediately subsequent Year on the first **Day** of such Year.

35.5.2(c) An employee entitled to sick time pursuant to the PSLL may use sick time for any of the following:

i. such employee's mental illness, physical illness, injury, or health condition or the care of such illness, injury, or condition or such employee's need for medical diagnosis or preventive medical care;
ii. such employee's care of a family member (an employee's child, spouse, domestic partner, parent, sibling, grandchild or grandparent, or the child or parent of an employee's spouse or domestic partner) who has a mental illness, physical illness, injury or health condition or who has a need for medical diagnosis or preventive medical care;
iii. closure of such employee's place of business by order of a public official due to a public health emergency; or
iv. such employee's need to care for a child whose school or childcare providerhas been closed due to a public health emergency.

35.5.2(d) An employer must not require an employee, as a condition of taking sick time, to search for a replacement. However, an employer may require an employee to provide: reasonable notice of the need to use sick time; reasonable documentation that the use of sick time was needed for a reason above if for an absence of more than three consecutive work days; and/or written confirmation that an employee used sick time pursuant to the PSLL. However, an employer may not require documentation specifying the nature of a medical condition or otherwise require disclosure of the details of a medical condition as a condition of providing sick time and health information obtained solely due to an employee's use of sick time pursuant to the PSLL must be treated by the

employer as confidential.

35.5.2(e) If an employer chooses to impose any permissible discretionary requirement as a condition of using sick time, it must provide to all employees a written policy containing those requirements, using a delivery method that reasonably ensures that employees receive the policy. If such employer has not provided its written policy, it may not deny sick time to an employee because of non-compliance with such a policy.

35.5.2(f) Sick time to which an employee is entitled must be paid no later than the payday for the next regular payroll period beginning after the sick time was used.

35.5.3 Exemptions and Exceptions. Notwithstanding the above, the PSLL does not apply to any of the following:

35.5.3(a) an independent contractor who does not meet the definition of employee under section 190(2) of the New York State Labor Law;

35.5.3(b) an employee covered by a valid collective bargaining agreement in effect on April 1, 2014, until the termination of such agreement;

35.5.3(c) an employee in the construction or grocery industry covered by a valid collective bargaining agreement if the provisions of the PSLL are expressly waived in such collective bargaining agreement;

35.5.3(d) an employee covered by another valid collective bargaining agreement if such provisions are expressly waived in such agreement and such agreement provides a benefit comparable to that provided by the PSLL for such employee;

35.5.3(e) an audiologist, occupational therapist, physical therapist, or speech language pathologist who is licensed by the New York State Department of Education and who calls in for work assignments at will, determines his or her own schedule, has the ability to reject or accept any assignment referred to him or her, and is paid an average hourly wage that is at least four times the federal minimum wage;

35.5.3(f) an employee in a work study program under Section 2753 of Chapter 42 of the United States Code;

35.5.3(g) an employee whose work is compensated by a qualified scholarship program as that term is defined in the Internal Revenue Code, Section 117 of Chapter 20 of the United States Code; or

35.5.3(h) a participant in a Work Experience Program (WEP) under section 336-c of the New York State Social Services Law.

35.5.4 Retaliation Prohibited. An employer may not threaten or engage in retaliation against an employee for exercising or attempting in good faith to exercise any right provided by the PSLL. In addition, an employer may not interfere with any investigation, proceeding, or hearing pursuant to the PSLL.

35.5.5 Notice of Rights.

35.5.5(a) An employer must provide its employees with written notice of their rights pursuant to the PSLL. Such notice must be in English and the primary language spoken

by an employee, provided that DCA has made available a translation into such language. Downloadable notices are available on DCA's website at http://www.nyc.gov/html/dca/html/law/PaidSickLeave.shtml.

35.5.5(b) Any person or entity that willfully violates these notice requirements is subject to a civil penalty in an amount not to exceed fifty dollars for each employee who was not given appropriate notice.

35.5.6 Records. An employer must retain records documenting its compliance with the PSLL for a period of at least three years, and must allow DCA to access such records in furtherance of an investigation related to an alleged violation of the PSLL.

35.5.7 Enforcement and Penalties.

35.5.7(a) Upon receiving a complaint alleging a violation of the PSLL, DCA has the right to investigate such complaint and attempt to resolve it through mediation. Within 30 **Days** of written notification of a complaint by DCA, or sooner in certain circumstances, the employer must provide DCA with a written response and such other information as DCA may request. If DCA believes that a violation of the PSLL has occurred, it has the right to issue a notice of violation to the employer.

35.5.7(b) DCA has the power to grant an employee or former employee all appropriate relief as set forth in New York City Administrative Code § 20-924(d). Such relief may include, among other remedies, treble damages for the wages that should have been paid, damages for unlawful retaliation, and damages and reinstatement for unlawful discharge. In addition, DCA may impose on an employer found to have violated the PSLL civil penalties not to exceed $500 for a first violation, $750 for a second violation within two years of the first violation, and
$1,000 for each succeeding violation within two years of the previous violation.

35.5.8 More Generous Polices and Other Legal Requirements. Nothing in the PSLL is intended to discourage, prohibit, diminish, or impair the adoption or retention of a more generous sick time policy, or the obligation of an employer to comply with any contract, collective bargaining agreement, employment benefit plan or other agreement providing more generous sick time. The PSLL provides minimum requirements pertaining to sick time and does not preempt, limit or otherwise affect the applicability of any other law, regulation, rule, requirement, policy or standard that provides for greater accrual or use by employees of sick leave or time, whether paid or unpaid, or that extends other protections to employees. The PSLL may not be construed as creating or imposing any requirement in conflict with any federal or state law, rule or regulation.

35.6 HireNYC: Hiring and Reporting Requirements. This Article 35.6 applies to construction contracts of $1,000,000 or more. The **Contractor** shall comply with the requirements of Articles 35.6.1-35.6.5 for all non-trades jobs (e.g., for an administrative position arising out of **Work** ant located in New York City). The **Contractor** shall reasonably cooperate with SBS and the **City** on specific outreach events, including "Hire-on-the-Spot" events, for the hiring of trades workers in connection with the **Work**. If provided elsewhere in this **Contract**, this **Contract** is subject to a project labor agreement.

35.6.1 Enrollment. The **Contractor** shall enroll with the HireNYC system, found at www.nyc.gov/sbs, within thirty (30) days after the registration of this **Contract** pursuant to Section 328 of the New York City Charter. The **Contractor** shall provide information about the business, designate a primary contact and say whether it intends to hire for any entry

to mid-level job opportunities arising from this **Contract** and located in New York City, and, if so, the approximate start date of the first hire.

35.6.2 Job Posting Requirements.

35.6.2(a) Once enrolled in HireNYC, the **Contractor** agrees to update the HireNYC portal with all entry to mid-level job opportunities arising from this **Contract** and located in New York City, if any, which shall be defined as jobs requiring no more than an associate degree, as provided by the New York State Department of Labor (see Column F of https://labor.ny.gov/stats/2012-2022- NYS- Employment-Prospects.xls). The information to be updated includes the types of entry and mid-level positions made available from the work arising from the **Contract** and located in New York City, the number of positions, the anticipated schedule of initiating the hiring process for these positions, and the contact information for the **Contractor's** representative charged with overseeing hiring. The **Contractor** must update the HireNYC portal with any hiring needs arising from the contract and located in New York City, and the requirements of the jobs to be filled, no less than three weeks prior to the intended first day of employment for each new position, except with the permission of SBS, not to be unreasonably withheld, and must also update the HireNYC portal as set forth below.

35.6.2(b) After enrollment through HireNYC and submission of relevant information, SBS will work with the **Contractor** to develop a recruitment plan which will outline the candidate screening process, and will provide clear instructions as to when, where, and how interviews will take place. HireNYC will screen applicants based on employer requirements and refer applicants whom it believes are qualified to the **Contractor** for interviews. The **Contractor** must interview referred applicants whom it believes are qualified.

35.6.2(c) After completing an interview of a candidate referred by HireNYC, the **Contractor** must provide feedback via the portal within twenty (20) business days to indicate which candidates were interviewed and hired, if any. In addition, the **Contractor** shall provide the start date of new hires, and additional information reasonably related to such hires, within twenty (20) business days after the start date. In the event the **Contractor** does not have any job openings covered by this Rider in any given year, the **Contractor** shall be required to provide an annual update to HireNYC to that effect. For this purpose, the reporting year shall run from the date of the registration of the **Contract** pursuant to Charter section 328 and each anniversary date.

35.6.2(d) These requirements do not limit the **Contractor's** ability to assess the qualifications of prospective workers, and to make final hiring and retention decisions. No provision of this Article 35.6 shall be interpreted so as to require the **Contractor** to employ any particular worker.

35.6.2(e) In addition, the provisions of this Article 35.6 shall not apply to positions that the **Contractor** intends to fill with employees employed pursuant to the job retention provision of Section 22-505 of the Administrative Code of the City of New York. The **Contractor** shall not be required to report such openings with HireNYC. However, the **Contractor** shall enroll with the HireNYC system pursuant to Article 35.6.1, above, and, if such positions subsequently become open, then the remaining provisions of this Article 35.6 will apply.

35.6.3 Breach and Liquidated Damages. If the **Contractor** fails to comply with the termsof the **ContrSact** and this Article 35.6 (l) by not enrolling its business with HireNYC; (2) by not informing HireNYC, as required, of open positions; or (3) by failing to interview a qualified candidate, the **Agency** may assess liquidated damages in the amount of two- thousand five hundred dollars ($2,500) per breach. For all other events of noncompliance with the terms of this Article 35.6, the **Agency** may assess liquidated damages in the amount of five hundred dollars ($500) per breach. Furthermore, in the event the **Contractor** breaches the requirements of this Article 35.6 during the term of the **Contract**, the **City** may hold the **Contractor** in default of this **Contract**.

35.6.4 Audit Compliance. In addition to the auditing requirements set forth in other partsof the **Contract**, the **Contractor** shall permit SBS and the **City** to inspect any and all records concerning or relating to job openings or the hiring of individuals for work arising from the **Contract** and located in New York City. The **Contractor** shall permit an inspection within seven (7) business days of the request.

35.6.5 Other Reporting Requirements. The **Contractor** shall report to the **City**, on amonthly basis, all information reasonably requested by the **City** that is necessary for the **City** to comply with any reporting requirements imposed by **Law**, including any requirement that the **City** maintain a publicly accessible database. In addition, the **Contractor** agrees to comply with all reporting requirements imposed by **Law**, or as otherwise requested by the **City**.

35.6.6 Federal Hiring Requirements. If this **Contract** is federally funded (as indicated elsewhere in this Contract), the **Contractor** shall comply with all federal hiring requirements as may be set forth in this **Contract**, including, as applicable: (a) Section 3 of the HUD Act of 1968, which requires, to the greatest extent feasible, economic opportunities for 30 percent of new hires be given to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing and Executive Order 11246, which prohibits discrimination in employment due to race, color, religion,sex or national origin, and requires the implementation of goals for minority and female participation for work involving any construction trade.

ARTICLE 36. NO DISCRIMINATION

36.1 The **Contractor** specifically agrees, as required by Labor Law Section 220-e, as amended, that:

36.1.1 In the hiring of employees for the performance of **Work** under this **Contract** or any subcontract hereunder, neither the **Contractor**, **Subcontractor**, nor any person acting on behalf of such **Contractor** or **Subcontractor**, shall by reason of race, creed, color or national origin discriminate against any citizen of the State of New York who is qualifiedand available to perform the **Work** to which the employment relates;

36.1.2 Neither the **Contractor**, **Subcontractor**, nor any person on its behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of **Work** under this **Contract** on account of race, creed, color or national origin;

36.1.3 There may be deducted from the amount payable to the **Contractor** by the **City** under this **Contract** a penalty of fifty ($50.00) dollars for each person for each **Day** during which such person was discriminated against or intimidated in violation of the provisions of this

Contract; and

36.1.4 This **Contract** may be cancelled or terminated by the **City** and all moneys due or to become due hereunder may be forfeited, for a second or any subsequent violation of the terms or conditions of this Article 36.

36.1.5 This Article 36 covers all construction, alteration and repair of any public building or public work occurring in the State of New York and the manufacture, sale, and distribution of materials, equipment, and supplies to the extent that such operations are performed within the State of New York pursuant to this **Contract**.

36.2 The **Contractor** specifically agrees, as required by Section 6-108 of the Administrative Code,as amended, that:

36.2.1 It shall be unlawful for any person engaged in the construction, alteration or repairof buildings or engaged in the construction or repair of streets or highways pursuant to a **Contract** with the **City** or engaged in the manufacture, sale or distribution of materials, equipment or supplies pursuant to a **Contract** with the **City** to refuse to employ or to refuse to continue in any employment any person on account of the race, color or creed of such person.

36.2.2 It shall be unlawful for any person or any servant, agent or employee of any person, described in Article 36.1.2, to ask, indicate or transmit, orally or in writing, directly or indirectly, the race, color or creed or religious affiliation of any person employed or seeking employment from such person, firm or corporation.

36.2.3 Breach of the foregoing provisions shall be deemed a violation of a material provision of this **Contract**.

36.2.4 Any person, or the employee, manager or owner of or officer of such firm or corporation who shall violate any of the provisions of this Article 36.2 shall, upon conviction thereof, be punished by a fine of not more than one hundred ($100.00) dollars or by imprisonment for not more than thirty (30) **Days**, or both.

36.3 This **Contract** is subject to the requirements of Executive Order No. 50 (1980) ("E.O. 50"), as revised, and the rules and regulations promulgated thereunder. No contract will be awarded unless and until these requirements have been complied with in their entirety. By signing this **Contract**, the **Contractor** agrees that it:

36.3.1 Will not engage in any unlawful discrimination against any employee or applicantfor employment because of race, creed, color, national origin, sex, age, disability, marital status or sexual orientation with respect to all employment decisions including, but not limited to, recruitment, hiring, upgrading, demotion, downgrading, transfer, training, ratesof pay or other forms of compensation, layoff, termination, and all other terms and conditions of employment; and

36.3.2 Will not engage in any unlawful discrimination in the selection of **Subcontractors** on the basis of the owner's race, color, creed, national origin, sex, age, disability, marital status or sexual orientation; and

36.3.3 Will state in all solicitations or advertisements for employees placed by or on behalf of the **Contractor** that all qualified applicants will receive consideration for employment without unlawful discrimination based on race, creed, color, national origin, sex, age, citizens status,

disability, marital status, sexual orientation, or that it is an equal employment opportunity employer; and

36.3.4 Will send to each labor organization or representative of workers with which it has a collective bargaining agreement or other contract or memorandum of understanding, written notification of its equal employment opportunity commitments under E.O. 50 and the rules and regulations promulgated thereunder; and

36.3.5 Will furnish, before the award of the **Contract**, all information and reports, including an employment report, that are required by E.O. 50, the rules and regulations promulgated thereunder, and orders of the **City** Department of Business Services, Division of Labor Services (**DLS**) and will permit access to its books, records, and accounts by the **DLS** for the purposes of investigation to ascertain compliance with such rules, regulations, and orders.

36.4 The **Contractor** understands that in the event of its noncompliance with the nondiscrimination clauses of this **Contract** or with any of such rules, regulations, or orders, such noncompliance shall constitute a material breach of this **Contract** and noncompliance with E.O. 50 and the rules and regulations promulgated thereunder. After a hearing held pursuant to the rules of the **DLS**, the Director of the **DLS** may direct the **Commissioner** to impose any or all of the following sanctions:

36.4.1 Disapproval of the **Contractor**; and/or

36.4.2 Suspension or termination of the **Contract**; and/or

36.4.3 Declaring the **Contractor** in default; and/or

36.4.4 In lieu of any of the foregoing sanctions, the Director of the **DLS** may impose an employment program.

In addition to any actions taken under this **Contract**, failure to comply with E.O. 50 and the rules and regulations promulgated thereunder, in one or more instances, may result in a **City Agency** declaring the **Contractor** to be non-responsible in future procurements. The **Contractor** further agrees that it will refrain from entering into any **Contract** or **Contract** modification subject to E.O. 50 and the rules and regulations promulgated thereunder with a **Subcontractor** who is not in compliance with the requirements of E.O. 50 and the rules and regulations promulgated thereunder.

36.5 The **Contractor** specifically agrees, as required by Section 6-123 of the AdministrativeCode, that:

36.5.1 The **Contractor** will not engage in any unlawful discriminatory practice in violation of Title 8 of the Administrative Code; and

36.5.2 Any failure to comply with this Article 36.5 may subject the **Contractor** to the remedies set forth in Section 6-123 of the Administrative Code, including, where appropriate, sanctions such as withholding of payment, imposition of an employment program, finding the **Contractor** to be in default, cancellation of the **Contract**, or any other sanction or remedy provided by **Law** or **Contract**.

ARTICLE 37. LABOR LAW REQUIREMENTS

37.1 The **Contractor** shall strictly comply with all applicable provisions of the Labor Law, as

amended. Such compliance is a material term of this **Contract**.

37.2 The **Contractor** specifically agrees, as required by Labor Law Sections 220 and 220-d, as amended, that:

37.2.1 Hours of **Work**: No laborer, worker, or mechanic in the employ of the **Contractor**, **Subcontractor** or other person doing or contracting to do the whole or a part of the **Work** contemplated by this **Contract** shall be permitted or required to work more than eight (8) hours in any one (1) **Day**, or more than five (5) **Days** in any one (1) week, except as provided in the Labor Law and in cases of extraordinary emergency including fire, flood, or danger to life or property, or in the case of national emergency when so proclaimed by the President of the United States of America.

37.2.2 In situations in which there are not sufficient laborers, workers, and mechanics who may be employed to carry on expeditiously the **Work** contemplated by this **Contract** as a result of such restrictions upon the number of hours and **Days** of labor, and the immediate commencement or prosecution or completion without undue delay of the **Work** is necessary for the preservation of the **Site** and/or for the protection of the life and limb of the persons using the same, such laborers, workers, and mechanics shall be permitted or required to work more than eight (8) hours in any one (1) **Day**; or five (5) **Days** in any one (1) week; provided, however, that upon application of any **Contractor**, the **Commissioner** shall have first certified to the Commissioner of Labor of the State of New York (hereinafter "Commissioner of Labor") that such public **Work** is of an important nature and that a delay in carrying it to completion would result in serious disadvantage to the public; and provided, further, that such Commissioner of Labor shall have determined that such an emergency does in fact exist as provided in Labor Law Section 220.2.

37.2.3 Failure of the **Commissioner** to make such a certification to the Commissioner of Labor shall not entitle the **Contractor** to damages for delay or for any cause whatsoever.

37.2.4 Prevailing Rate of Wages: The wages to be paid for a legal day's **Work** to laborers, workers, or mechanics employed upon the **Work** contemplated by this **Contract** or upon any materials to be used thereon shall not be less than the "prevailing rate of wage" as defined in Labor Law Section 220, and as fixed by the **Comptroller** in the attached Schedule of Wage Rates and in updated schedules thereof. The prevailing wage rates and supplemental benefits to be paid are those in effect at the time the **Work** is being performed.

37.2.5 Requests for interpretation or correction in the Information for Bidders includes all requests for clarification of the classification of trades to be employed in the performance of the **Work** under this **Contract**. In the event that a trade not listed in the **Contract** is in fact employed during the performance of this **Contract**, the **Contractor** shall be required to obtain from the **Agency** the prevailing wage rates and supplementary benefits for the trades used and to complete the performance of this **Contract** at the price at which the **Contract** was awarded.

37.2.6 Minimum Wages: Except for employees whose wage is required to be fixed pursuant to Labor Law Section 220, all persons employed by the **Contractor** and any **Subcontractor** in the manufacture or furnishing of the supplies, materials, or equipment, or the furnishing of work, labor, or services, used in the performance of this **Contract**, shall be paid, without subsequent deduction or rebate unless expressly authorized by **Law**, not less than the sum mandated by **Law**.

37.3 Working Conditions: No part of the **Work**, labor or services shall be performed or rendered by

the **Contractor** in any plants, factories, buildings or surroundings or under working conditions which are unsanitary or hazardous or dangerous to the health and safety of employees engaged in the performance of this **Contract**. Compliance with the safety, sanitary, and factory inspection **Laws** of the state in which the **Work** is to be performed shall be prima facie evidence of compliance with this Article 37.3.

37.4 Prevailing Wage Enforcement: The **Contractor** agrees to pay for all costs incurred by the **City** in enforcing prevailing wage requirements, including the cost of any investigation conducted by or on behalf of the **Agency** or the **Comptroller,** where the **City** discovers a failure to comply with any of the requirements of this Article 37 by the **Contractor** or its **Subcontractor(s)**. The **Contractor** also agrees that, should it fail or refuse to pay for any such investigation, the **Agency** is hereby authorized to deduct from a **Contractor's** account an amount equal to the cost of such investigation.

37.4.1 The Labor Law Section 220 and Section 220-d, as amended, provide that this **Contract** shall be forfeited and no sum paid for any **Work** done hereunder on a second conviction for willfully paying less than:

37.4.1(a) The stipulated prevailing wage scale as provided in Labor Law section 220, as amended, or

37.4.1(b) The stipulated minimum hourly wage scale as provided in Labor Law section 220-d, as amended.

37.4.2 For any breach or violation of either working conditions (Article 37.3) or minimum wages (Article 37.2.6) provisions, the party responsible therefor shall be liable to the **City** for liquidated damages, which may be withheld from any amounts due on any contracts with the **City** of such party responsible, or may be recovered in actions brought by the **City** Corporation Counsel in the name of the **City**, in addition to damages for any other breach of this **Contract**, for a sum equal to the amount of any underpayment of wages due to any employee engaged in the performance of this **Contract**. In addition, the **Commissioner** shall have the right to cancel contracts and enter into other contracts for the completion of the original contract, with or without public letting, and the original **Contractor** shall be liable for any additional cost. All sums withheld or recovered as deductions, rebates, refunds, or underpayment of wages hereunder, shall be held in a special deposit account and shall be paid without interest, on order of the **Comptroller**, directly to the employees who have been paid less than minimum rates of pay as set forth herein and on whose account such sums were withheld or recovered, provided that no claims by employees for such payments shall be entertained unless made within two (2) years from the date of actual notice to the **Contractor** of the withholding or recovery of such sums by the **City**.

37.4.3 A determination by the **Comptroller** that a **Contractor** and/or its **Subcontractor** willfully violated Labor Law Section 220 will be forwarded to the **City's** five District Attorneys for review.

37.4.4 The **Contractor's** or **Subcontractor's** noncompliance with this Article 37.4 and Labor Law Section 220 may result in an unsatisfactory performance evaluation and the **Comptroller** may also find and determine that the **Contractor** or **Subcontractor** willfully violated the New York Labor **Law**.

37.4.4(a) An unsatisfactory performance evaluation for noncompliance with this Article 37.4 may result in a determination that the **Contractor** is a non-responsible bidder on subsequent procurements with the **City** and thus a rejection of a future award

of a contract with the **City**, as well as any other sanctions provided for by**Law**.

37.4.4(b) Labor Law Section 220-b, as amended, provides that when two (2) final determinations have been rendered against a **Contractor** or **Subcontractor** within any consecutive six (6) year period determining that such **Contractor** or **Subcontractor** has willfully failed to pay the prevailing rate of wages or to provide supplements in accordance with the Labor Law and this Article 37.4, whether such failures were concurrent or consecutive and whether or not such final determinations concerning separate public works projects are rendered simultaneously, such **Contractor** or **Subcontractor** shall be ineligible to submit a bid on or be awarded any public works contract with the **City** for a period of five (5) years from the second final determination. If the final determination involves the falsification of payroll records or the kickback of wages or supplements, the **Contractor** or **Subcontractor** shall be ineligible to submit a bid on or be awarded any public works contract with the **City** for a period of five (5) years from the first final determination.

37.4.4(c) Labor Law Section 220, as amended, provides that the **Contractor** or **Subcontractor** found to have violated this Article 37.4 may be directed to make payment of wages or supplements including interest found to be due, and the **Contractor** or **Subcontractor** may be directed to make payment of a further sum asa civil penalty in an amount not exceeding twenty-five (25%) percent of the total amount found to be due.

37.5 The **Contractor** and its **Subcontractors** shall within ten (10) **Days** after mailing of a Noticeof Award or written order, post in prominent and conspicuous places in each and every plant, factory, building, and structure where employees of the **Contractor** and its **Subcontractors** engaged in the performance of this **Contract** are employed, notices furnished by the **City**, in relation to prevailing wages and supplements, minimum wages, and other stipulations contained in Sections 220 and 220-h of the Labor Law, and the **Contractor** and its **Subcontractors** shall continue to keep such notices posted in such prominent and conspicuous places until **Final Acceptance** of the supplies, materials, equipment, or **Work**, labor, or services required to be furnished or rendered under this **Contract**.

37.6 The **Contractor** shall strictly comply with all of the provisions of Articles 37.6.1 through 37.6.5, and provide for all workers, laborers or mechanics in its employ, the following:

37.6.1 Notices Posted At **Site**: Post, in a location designated by the **City**, schedules of prevailing wages and supplements for this **Project**, a copy of all re-determinations of such schedules for the **Project**, the Workers' Compensation **Law** Section 51 notice, all other notices required by **Law** to be posted at the **Site**, the **City** notice that this **Project** is a public works project on which each worker is entitled to receive the prevailing wages and supplements for the occupation at which he or she is working, and all other notices whichthe **City** directs the **Contractor** to post. The **Contractor** shall provide a surface for such notices which is satisfactory to the **City**. The **Contractor** shall maintain and keep current such notices in a legible manner and shall replace any notice or schedule which is damaged, defaced, illegible or removed for any reason. The **Contractor** shall post such notices before commencing any **Work** on the **Site** and shall maintain such notices until all **Work**on the **Site** is complete; and

37.6.2 Daily **Site** Sign-in Sheets: Maintain daily **Site** sign-in sheets, and require that **Subcontractors** maintain daily **Site** sign-in sheets for its employees, which include blank spaces for an employee's name to be both printed and signed, job title, date started and Social Security number, the time the employee began work and the time the employee left

work, until **Final Acceptance** of the supplies, materials, equipment, or **Work**, labor, or services to be furnished or rendered under this **Contract** unless exception is granted by the **Comptroller** upon application by the **Agency**. In the alternative, subject to the approval of the **CCPO**, the **Contractor** and **Subcontractor** may maintain an electronic or biometric sign-in system, which provides the information required by this Article 37.6.2; and

37.6.3 Individual Employee Information Notices: Distribute a notice to each worker, laborer or mechanic employed under this **Contract**, in a form provided by the **Agency**, that this **Project** is a public works project on which each worker, laborer or mechanic is entitled to receive the prevailing rate of wages and supplements for the occupation at which he orshe is working. If the total cost of the **Work** under this **Contract** is at least two hundred fifty thousand ($250,000) dollars, such notice shall also include a statement that each worker, laborer or mechanic must be certified prior to performing any **Work** as having successfully completed a course in construction safety and health approved by the United States Department of Labor's Occupational Safety and Health Administration that is at least ten (10) hours in duration. Such notice shall be distributed to each worker before he or she starts performing any **Work** of this **Contract** and with the first paycheck after July first of each year. "Worker, laborer or mechanic" includes employees of the **Contractor** and all **Subcontractors** and all employees of suppliers entering the **Site**. At the time of distribution, the **Contractor** shall have each worker, laborer or mechanic sign a statement, in a form provided by the **Agency**, certifying that the worker has received the notice required by this Article 37.6.3, which signed statement shall be maintained with the payroll records required by this **Contract**; and

37.6.3(a) The **Contractor** and each **Subcontractor** shall notify each worker, laborer or mechanic employed under this **Contract** in writing of the prevailing rate of wages for their particular job classification. Such notification shall be given to every worker, laborer, and mechanic on their first pay stub and with every pay stub thereafter; and

37.6.4 **Site** Laminated Identification Badges: The **Contractor** shall provide laminated identification badges which include a photograph of the worker's, laborer's or mechanic's face and indicate the worker's, laborer's or mechanic's name, trade, employer's name, and employment starting date (month/day/year). Further, the **Contractor** shall require as acondition of employment on the **Site**, that each and every worker, laborer or mechanic wear the laminated identification badge at all times and that it may be seen by any representative of the **City**. The **Commissioner** may grant a written waiver from the requirement that the laminated identification badge include a photograph if the **Contractor** demonstrates that the identity of an individual wearing a laminated identification badge can be easily verified by another method; and

37.6.5 Language Other Than English Used On **Site**: Provide the **ACCO** notice when three (3) or more employees (worker and/or laborer and/or mechanic) on the **Site**, at any time, speak a language other than English. The **ACCO** will then provide the **Contractor** the notices described in Article 37.6.1 in that language or languages as may be required. The **Contractor** is responsible for all distributions under this Article 37; and

37.6.6 Provision of Records: The **Contractor** and **Subcontractor(s)** shall produce within five (5) **Days** on the **Site** of the **Work** and upon a written order of the **Engineer**, the **Commissioner**, the **ACCO**, the **Agency EAO**, or the **Comptroller,** such records as are required to be kept by this Article 37.6; and

37.6.7 The **Contractor** and **Subcontractor(s)** shall pay employees by check or direct deposit. If this **Contract** is for an amount greater than one million ($1,000,000) dollars, checks issued by the **Contractor** to covered employees shall be generated by a payroll service or automated payroll system (an in-house system may be used if approved by the **Agency**). For any subcontract for an amount greater than seven hundred fifty thousand ($750,000) dollars, checks issued by a **Subcontractor** to covered employees shall be generated by a payroll service or automated payroll system (an in-house system may be usedif approved by the **Agency**); and

37.6.8 The failure of the **Contractor** or **Subcontractor(s)** to comply with the provisions of Articles 37.6.1 through 37.6.7 may result in the **Commissioner** declaring the **Contractor** in default and/or the withholding of payments otherwise due under the **Contract**.

37.7 The **Contractor** and its **Subcontractors** shall keep such employment and payroll records as are required by Section 220 of the Labor Law. The failure of the **Contractor** or **Subcontractor(s)** to comply with the provisions of this Article 37.7 may result in the **Commissioner** declaring the **Contractor** in default and/or the withholding of payments otherwise due under the **Contract.**

37.8 At the time the **Contractor** makes application for each partial payment and for final payment, the **Contractor** shall submit to the **Commissioner** a written payroll certification, in the form provided by this **Contract**, of compliance with the prevailing wage, minimum wage, and other provisions and stipulations required by Labor Law Section 220 and of compliance with the training requirements of Labor Law Section 220-h set forth in Article 35.2. This certification of compliance shall be a condition precedent to payment and no payment shall be made to the **Contractor** unless and until each such certification shall have been submitted to and received by the **Commissioner**.

37.9 This **Contract** is executed by the **Contractor** with the express warranty and representation that the **Contractor** is not disqualified under the provisions of Section 220 of the Labor Law from the award of the **Contract**.

37.10 Any breach or violation of any of the foregoing shall be deemed a breach or violation of a material provision of this **Contract**, and grounds for cancellation thereof by the **City**.

ARTICLE 38. PAYROLL REPORTS

38.1 The **Contractor** and its **Subcontractor(s)** shall maintain on the **Site** during the performanceof the **Work** the original payrolls or transcripts thereof which the **Contractor** and its **Subcontractor(s)** are required to maintain and shall submit such original payrolls or transcripts, subscribed and affirmed by it as true, within thirty (30) **Days** after issuance of its first payroll, and every thirty (30) **Days** thereafter, pursuant to Labor Law Section 220(3-a)(a)(iii). The **Contractor** and **Subcontractor(s)** shall submit such original payrolls or transcripts along with each and every payment requisition. If payment requisitions are not submitted at least once a month, the **Contractor** and its **Subcontractor(s)** shall submit original payrolls and transcripts both along with its payment requisitions and independently of its payment requisitions.

38.2 The **Contractor** shall maintain payrolls or transcripts thereof for six (6) years from the date of completion of the **Work** on this **Contract**. If such payrolls and transcripts are maintained outside of New York City after the completion of the **Work** and their production is required pursuant to this Article 38, the **Contractor** shall produce such records in New York City upon request by the City.

38.3 The **Contractor** and **Subcontractor(s)** shall comply with any written order, direction, or request made by the **Engineer**, the **Commissioner**, the **ACCO**, the **Agency EAO**, the **Agency Labor Law**

Investigator(s), or the **Comptroller**, to provide to the requesting party any of the following information and/or records within five (5) **Days** of such written order, direction, or request:

38.3.1 Such original payrolls or transcripts thereof subscribed and affirmed by it as true and the statements signed by each worker pursuant to this Chapter VIII; and/or

38.3.2 Attendance sheets for each **Day** on which any employee of the **Contractor** and/or any of the **Subcontractor(s)** performed **Work** on the **Site**, which attendance sheet shall be in a form acceptable to the **Agency** and shall provide information acceptable to the **Agency** to identify each such employee; and/or

38.3.3 Any other information to satisfy the **Engineer**, the **Commissioner**, the **ACCO**, the **Agency EAO**, the **Agency Labor Law Investigator(s)** or the **Comptroller**, that this Chapter VIII and the Labor Law, as to the hours of employment and prevailing rates of wages and/or supplemental benefits, are being observed.

38.4 The failure of the **Contractor** or **Subcontractor(s)** to comply with the provisions of Articles 38.1 and/or 38.2 may result in the **Commissioner** declaring the **Contractor** in default and/or the withholding of payments otherwise due under the **Contract**.

ARTICLE 39. DUST HAZARDS

39.1 Should a harmful dust hazard be created in performing the **Work** of this **Contract**, for the elimination of which appliances or methods have been approved by the Board of Standards and Appeals of the City of New York, such appliances and methods shall be installed, maintained, and effectively operated during the continuance of such harmful dust hazard. Failure to comply with this provision after notice shall make this **Contract** voidable at the sole discretion of the **City**.

CHAPTER IX: PARTIAL AND FINAL PAYMENTS

ARTICLE 40. CONTRACT PRICE

40.1 The **City** shall pay, and the **Contractor** agrees to accept, in full consideration for the **Contractor's** performance of the **Work** subject to the terms and conditions hereof, the lump sum priceor unit prices for which this **Contract** was awarded, plus the amount required to be paid for any **Extra Work** ordered by the **Commissioner** under Article 25, less credit for any **Work** omitted pursuant to Article 29.

ARTICLE 41. BID BREAKDOWN ON LUMP SUM

41.1 Within fifteen (15) **Days** after the commencement date specified in the **Notice to Proceed** or **Order to Work**, unless otherwise directed by the **Resident Engineer**, the **Contractor** shall submitto the **Resident Engineer** a breakdown of its bid price, or of lump sums bid for items of the **Contract**, showing the various operations to be performed under the **Contract**, as directed in the progress schedule required under Article 9, and the value of each of such operations, the total of such items to equal the lump sum price bid. Said breakdown must be approved in writing by the **Resident Engineer**.

41.2 No partial payment will be approved until the **Contractor** submits a bid breakdown that is acceptable to the **Resident Engineer**.

41.3 The **Contractor** shall also submit such other information relating to the bid breakdown as directed by the **Resident Engineer**. Thereafter, the breakdown may be used only for checking the **Contractor's** applications for partial payments hereunder, but shall not be binding upon the **City**, the **Commissioner**, or the **Engineer** for any purpose whatsoever.

ARTICLE 42. PARTIAL PAYMENTS

42.1 From time to time as the **Work** progresses satisfactorily, but not more often than once each calendar month (except where the **Commissioner** approves in writing the submission of invoices on a more frequent basis and for invoices relating to **Work** performed pursuant to a change order), the **Contractor** may submit to the **Engineer** a requisition for a partial payment in the prescribed form, which shall contain an estimate of the quantity and the fair value of the **Work** done during the payment period.

42.2 Partial payments may be made for materials, fixtures, and equipment in advance of their actual incorporation in the **Work**, as the **Commissioner** may approve, and upon the terms and conditions set forth in the General Conditions.

42.3 The **Contractor** shall also submit to the **Commissioner** in connection with every application for partial payment a verified statement in the form prescribed by the **Comptroller** setting forth the information required under Labor Law Section 220-a.

42.4 Within thirty (30) **Days** after receipt of a satisfactory payment application, and within sixty (60) **Days** after receipt of a satisfactory payment application in relation to **Work** performed pursuant to a change order, the **Engineer** will prepare and certify, and the **Commissioner** will approve, a voucher for a partial payment in the amount of such approved estimate, less any and all deductions authorized to be made by the **Commissioner** under the terms of this **Contract** or by **Law**.

ARTICLE 43. PROMPT PAYMENT

43.1 The Prompt Payment provisions of the **PPB** Rules in effect at the time of the bid will be applicable to payments made under this **Contract**. The provisions require the payment to the **Contractor** of interest on payments made after the required payment date, except as set forth in the **PPB** Rules.

43.2 The **Contractor** shall submit a proper invoice to receive payment, except where the **Contract** provides that the **Contractor** will be paid at predetermined intervals without having to submit an invoice for each scheduled payment.

43.3 Determination of interest due will be made in accordance with the **PPB** Rules.

43.4 If the **Contractor** is paid interest, the proportionate share(s) of that interest shall be forwarded by the **Contractor** to its **Subcontractor(s)**.

43.5 The **Contractor** shall pay each **Subcontractor** or **Materialman** not later than seven (7) **Days** after receipt of payment out of amounts paid to the **Contractor** by the **City** for **Work** performed by the **Subcontractor** or **Materialman** under this **Contract**.

43.5.1 If **Contractor** fails to make any payment to any **Subcontractor** or **Materialman** within seven (7) **Days** after receipt of payment by the **City** pursuant to this Article 43.5,

then the **Contractor** shall pay interest on amounts due to such **Subcontractor** or **Materialman** at the rate of interest in effect on the date such payment is made by the **Contractor** computed in accordance with Section 756-b (1)(b) of the New York General Business Law. Accrual of interest shall commence on the **Day** immediately following the expiration of the seventh **Day** following receipt of payment by the **Contractor** from the **City** and shall end on the date on which payment is made.

43.6 The **Contractor** shall include in each of its subcontracts a provision requiring each **Subcontractor** to make payment to each of its **Subcontractors** or **Materialmen** for **Work** performed under this **Contract** in the same manner and within the same time period set forth above.

ARTICLE 44. SUBSTANTIAL COMPLETION PAYMENT

44.1 The **Contractor** shall submit with the **Substantial Completion** requisition:

44.1.1 A final verified statement of any pending Article 27 disputes in accordance with the **PPB** Rules and this **Contract** and any and all alleged claims against the **City**, in any way connected with or arising out of this **Contract** (including those as to which details may have been furnished pursuant to Articles 11, 27, 28, and 30) setting forth with respect to each such claim the total amount thereof, the various items of labor and materials included therein, and the alleged value of each item; and if the alleged claim be one for delay, the alleged cause of each such delay, the period or periods of time, giving the dates when the **Contractor** claims the performance of the **Work** or a particular part thereof was delayed,and an itemized statement and breakdown of the amount claimed for each such delay.

44.1.1(a) With respect to each such claim, the **Commissioner**, the **Comptroller** and, in the event of litigation, the **City** Corporation Counsel shall have the same right to inspect, and to make extracts or copies of, the **Contractor's** books, vouchers, records, etc., as is referred to in Articles 11, 27, 28, and 30. Nothing contained in this Article 44.1.1(a) is intended to or shall relieve the **Contractor** from the obligation of complying strictly with Articles 11, 27, 28, and 30. The **Contractor** is warned that unless such claims are completely set forth as herein required, the **Contractor** upon acceptance of the **Substantial Completion** payment pursuant to this Article 44, will have waived any such claims.

44.1.2 A **Final Approved Punch List**.

44.1.3 Where required, a request for an extension of time to achieve **Substantial Completion** or final extension of time.

44.2 The **Commissioner** shall issue a voucher calling for payment of any part or all of the balance due for **Work** performed under the **Contract**, including monies retained under Article 21, less any and all deductions authorized to be made by the **Commissioner**, under this **Contract** or by **Law**, and less twice the amount the **Commissioner** considers necessary to ensure the completion of the balance of the **Work** by the **Contractor**. Such a payment shall be considered a partial and not a final payment. No **Substantial Completion** payment shall be made under this Article 44 where the **Contractor** failed to complete the **Work** within the time fixed for such completion in the Schedule A of the General Conditions, or within the time to which completion may have been extended, until an extension or extensions of time for the completion of **Work** have been acted upon pursuant to Article 13.

44.3 No further partial payments shall be made to the **Contractor** after **Substantial Completion**, except the **Substantial Completion** payment and payment pursuant to any **Contractor's** requisition that were properly filed with the **Commissioner** prior to the date of **Substantial Completion**; however, the **Commissioner** may grant a waiver for further partial payments after the date of **Substantial Completion** to permit payments for change order **Work** and/or release of retainage and deposits pursuant to Articles 21 and 24. Such waiver shall be in writing.

44.4 The **Contractor** acknowledges that nothing contained in this Article 44 is intended to or shall in any way diminish the force and effect of Article 13.

ARTICLE 45. FINAL PAYMENT

45.1 After completion and **Final Acceptance** of the **Work**, the **Contractor** shall submit all required certificates and documents, together with a requisition for the balance claimed to be due under the **Contract**, less the amount authorized to be retained for maintenance under Article 24. Such submission shall be within 90 days of the date of the **Commissioner's** written determination of **Final Acceptance**, or within such additional time as may be granted by the **Commissioner** in writing. If the **Contractor** fails to submit all required certificates and documents within the time allowed, no payment of the balance claimed shall be made to the **Contractor** and the **Contractor** shall be deemed to have forfeited its right to payment of any balance claimed. A verified statement similar to that required in connection with applications for partial payments shall also be submitted to the **Commissioner**.

45.2 Amended Verified Statement of Claims: The **Contractor** shall also submit with the final requisition any amendments to the final verified statement of any pending dispute resolution procedures in accordance with the **PPB** Rules and this **Contract** and any and all alleged claims against the **City**, in any way connected with or arising out of this **Contract** (including those as to which details may have been furnished pursuant to Articles 11, 27, 28, and 30) that have occurred subsequent to **Substantial Completion**, setting forth with respect to each such claim the total amount thereof, the various items of labor and materials included therein, and the alleged value of each such item; and if the alleged claim be one for delay, the alleged cause of each such delay, the period or periods of time, giving the dates when the **Contractor** claims the performance of the **Work** or a particular part thereof was delayed, and an itemized statement and breakdown of the amount claimed for each such delay. With reference to each such claim, the **Commissioner**, the **Comptroller** and, in the event of litigation, the **City** Corporation Counsel shall have the same right to inspect, and to make extracts or copies of, the **Contractor's** books, vouchers, records, etc., as is referred to in Articles 11, 27, 28, and 30. Nothing contained in this Article 45.2, is intended to or shall relieve the **Contractor** from the obligation of complying strictly with Articles 11, 27, 28, and 30. The **Contractor** is warned that unless such claims are completely set forth as herein required, the **Contractor**, upon acceptance of the Final Payment pursuant to Article 46, will have waived any such claims.

45.3 Preparation of Final Voucher: Upon determining the balance due hereunder other than on account of claims, the **Engineer** will prepare and certify, for the Commissioner's approval, a voucher for final payment in that amount less any and all deductions authorized to be made by the **Commissioner** under this **Contract** or by **Law**. In the case of a lump sum **Contract**, the **Commissioner** shall certify the voucher for final payment within thirty (30) **Days** from the date of completion and acceptance of the **Work**, provided all requests for extensions of time have been acted upon.

45.3.1 All prior certificates and vouchers upon which partial payments were made, being merely estimates made to enable the **Contractor** to prosecute the **Work** more advantageously, shall be subject to correction in the final voucher, and the certification of the **Engineer**

thereon and the approval of the **Commissioner** thereof, shall be conditions precedent to the right of the **Contractor** to receive any money hereunder. Such final voucher shall be binding and conclusive upon the **Contractor**.

45.3.2 Payment pursuant to such final voucher, less any deductions authorized to be made by the **Commissioner** under this **Contract** or by **Law**, shall constitute the final payment, and shall be made by the **Comptroller** within thirty (30) **Days** after the filing of such voucher in his/her office.

45.4 The **Contractor** acknowledges that nothing contained in this Article 45 is intended to or shall in any way diminish the force and effect of Article 13.

ARTICLE 46. ACCEPTANCE OF FINAL PAYMENT

46.1 The acceptance by the **Contractor**, or by anyone claiming by or through it, of the final payment, whether such payment be made pursuant to any judgment of any court, or otherwise, shall constitute and operate as a release of the **City** from any and all claims of and liability to the **Contractor** for anything heretofore done or furnished for the **Contractor** relating to or arising out of this **Contract** and the **Work** done hereunder, and for any prior act, neglect or default on the part of the **City** or any of its officials, agents or employees, excepting only a claim against the **City** for the amounts deducted or retained in accordance with the terms and provisions of this **Contract** or by **Law**, and excepting any claims, not otherwise waived, or any pending dispute resolution procedures which are contained in the verified statement filed with the **Contractor's** substantial and final requisitions pursuant to Articles 44and 45.

46.2 The **Contractor** is warned that the execution by it of a release, in connection with the acceptance of the final payment, containing language purporting to reserve claims other than those herein specifically excepted from the operation of this Article 46, or those for amounts deducted by the **Commissioner** from the final requisition or from the final payment as certified by the **Engineer** and approved by the **Commissioner**, shall not be effective to reserve such claims, anything stated to the **Contractor** orally or in writing by any official, agent or employee of the **City** to the contrary notwithstanding.

46.3 Should the **Contractor** refuse to accept the final payment as tendered by the **Comptroller**, it shall constitute a waiver of any right to interest thereon.

46.4 The **Contractor**, however, shall not be barred by this Article 46 from commencing an action for breach of **Contract** to the extent permitted by **Law** and by the terms of the **Contract** for any claims that are contained in the verified statement filed with the **Contractor's** substantial and final requisitions pursuant to Articles 44 and 45 or that arose after submission of the final payment requisition, provided that a detailed and verified statement of claim is served upon the contracting **Agency** and **Comptroller** not later than forty (40) **Days** after the making of such final payment by electronic funds transfer (EFT)or the mailing of such final payment. The statement shall specify the items upon which the claim will be based and any such claim shall be limited to such items.

ARTICLE 47. APPROVAL BY PUBLIC DESIGN COMMISSION

47.1 All works of art, including paintings, mural decorations, stained glass, statues, bas-reliefs, and other sculptures, monuments, fountains, arches, and other structures of a permanent character intendedfor ornament or commemoration, and every design of the same to be used in the performance of this **Contract**, and the design of all bridges, approaches, buildings, gates, fences, lamps, or structures to be erected, pursuant

to the terms of this **Contract**, shall be submitted to the Art Commission, d/b/a the Public Design Commission of the City of New York, and shall be approved by the Public Design Commission prior to the erection or placing in position of the same. The final payment shall not become due or payable under this **Contract** unless and until the Public Design Commission shall certify that the design for the **Work** herein contracted for has been approved by the said Public Design Commission, and that the same has been executed in substantial accordance with the design so approved, pursuant to the provisions of Chapter 37, Section 854 of the **City** Charter, as amended.

CHAPTER X: CONTRACTOR'S DEFAULT

ARTICLE 48. COMMISSIONER'S RIGHT TO DECLARE CONTRACTOR IN DEFAULT

48.1 In addition to those instances specifically referred to in other Articles herein, the **Commissioner** shall have the right to declare the **Contractor** in default of this **Contract** if:

48.1.1 The **Contractor** fails to commence **Work** when notified to do so by the **Commissioner**; or if

48.1.2 The **Contractor** shall abandon the **Work**; or if

48.1.3 The **Contractor** shall refuse to proceed with the **Work** when and as directed by the **Commissioner**; or if

48.1.4 The **Contractor** shall, without just cause, reduce its working force to a number which, if maintained, would be insufficient, in the opinion of the **Commissioner**, to complete the **Work** in accordance with the progress schedule; or if

48.1.5 The **Contractor** shall fail or refuse to increase sufficiently such working force when ordered to do so by the **Commissioner**; or if

48.1.6 The **Contractor** shall sublet, assign, transfer, convert or otherwise dispose of this **Contract** other than as herein specified; or sell or assign a majority interest in the **Contractor**; or if

48.1.7 The **Contractor** fails to secure and maintain all required insurance; or if

48.1.8 A receiver or receivers are appointed to take charge of the **Contractor's** property or affairs; or if

48.1.9 The **Commissioner** shall be of the opinion that the **Contractor** is or has been unnecessarily or unreasonably or willfully delaying the performance and completion of the **Work**, or the award of necessary subcontracts, or the placing of necessary material and equipment orders; or if

48.1.10 The **Commissioner** shall be of the opinion that the **Contractor** is or has been willfully or in bad faith violating any of the provisions of this **Contract**; or if

48.1.11 The **Commissioner** shall be of the opinion that the **Work** cannot be completed within the time herein provided therefor or within the time to which such completion may have been extended; provided, however, that the impossibility of timely completion is, in the

Commissioner's opinion, attributable to conditions within the **Contractor's** control; orif

48.1.12 The **Work** is not completed within the time herein provided therefor or within the time to which the **Contractor** may be entitled to have such completion extended; or if

48.1.13 Any statement or representation of the **Contractor** in the **Contract** or in any document submitted by the **Contractor** with respect to the **Work**, the **Project**, or the **Contract** (or for purposes of securing the **Contract**) was untrue or incorrect when made; or if

48.1.14 The **Contractor** or any of its officers, directors, partners, five (5%) percent shareholders, principals, or other persons substantially involved in its activities, commits any of the acts or omissions specified as the grounds for debarment in the **PPB** Rules.

48.2 Before the **Commissioner** shall exercise his/her right to declare the **Contractor** in default, the **Commissioner** shall give the **Contractor** an opportunity to be heard, upon not less than two (2) **Days**' notice.

ARTICLE 49. EXERCISE OF THE RIGHT TO DECLARE DEFAULT

49.1 The right to declare the **Contractor** in default for any of the grounds specified or referred to in Article 48 shall be exercised by sending the **Contractor** a notice, signed by the **Commissioner**, setting forth the ground or grounds upon which such default is declared (hereinafter referred to as a "Notice of Default").

49.2 The **Commissioner's** determination that the **Contractor** is in default shall be conclusive, final, and binding on the parties and such a finding shall preclude the **Contractor** from commencing a plenary action for any damages relating to the **Contract**. If the **Contractor** protests the determination of the **Commissioner**, the **Contractor** may commence an action in a court of competent jurisdiction of the State of New York under Article 78 of the New York Civil Practice Law and Rules.

ARTICLE 50. QUITTING THE SITE

50.1 Upon receipt of such notice the **Contractor** shall immediately discontinue all further operations under this **Contract** and shall immediately quit the **Site**, leaving untouched all plant, materials, equipment, tools, and supplies then on the **Site**.

ARTICLE 51. COMPLETION OF THE WORK

51.1 The **Commissioner**, after declaring the **Contractor** in default, may then have the **Work** completed by such means and in such manner, by contract with or without public letting, or otherwise, as he/she may deem advisable, utilizing for such purpose such of the **Contractor's** plant, materials, equipment, tools, and supplies remaining on the **Site**, and also such **Subcontractors**, as he/she may deem advisable.

51.2 After such completion, the **Commissioner** shall make a certificate stating the expense incurred in such completion, which shall include the cost of re-letting and also the total amount of liquidated damages (at the rate provided for in the **Contract**) from the date when the **Work** should have been completed by the **Contractor** in accordance with the terms hereof to the date of actual completion of the **Work**. Such certificate shall be binding and conclusive upon the **Contractor**, its sureties, and any person claiming under the **Contractor**, as to the amount thereof.

51.3 The expense of such completion, including any and all related and incidental costs, as so certified by the **Commissioner**, and any liquidated damages assessed against the **Contractor**, shall be charged against and deducted out of monies which are earned by the **Contractor** prior to the date of default. Should the expense of such completion, as certified by the **Commissioner**, exceed the total sum which would have been payable under the **Contract** if it had been completed by the **Contractor**, any excess shall be paid by the **Contractor**.

ARTICLE 52. PARTIAL DEFAULT

52.1 In case the **Commissioner** shall declare the **Contractor** in default as to a part of the **Work** only, the **Contractor** shall discontinue such part, shall continue performing the remainder of the **Work**in strict conformity with the terms of this **Contract**, and shall in no way hinder or interfere with any **Other Contractor(s)** or persons whom the **Commissioner** may engage to complete the **Work** as to which the **Contractor** was declared in default.

52.2 The provisions of this Chapter relating to declaring the **Contractor** in default as to the entire **Work** shall be equally applicable to a declaration of partial default, except that the **Commissioner** shallbe entitled to utilize for completion of the part of the **Work** as to which the **Contractor** was declared in default only such plant, materials, equipment, tools, and supplies as had been previously used by the **Contractor** on such part.

ARTICLE 53. PERFORMANCE OF UNCOMPLETED WORK

53.1 In completing the whole or any part of the **Work** under the provisions of this Chapter X, the **Commissioner** shall have the power to depart from or change or vary the terms and provisions of this **Contract**, provided, however, that such departure, change or variation is made for the purpose ofreducing the time or expense of such completion. Such departure, change or variation, even to the extent of accepting a lesser or different performance, shall not affect the conclusiveness of the **Commissioner's** certificate of the cost of completion referred to in Article 51, nor shall it constitute a defense to an action to recover the amount by which such certificate exceeds the amount which would have been payable to the **Contractor** hereunder but for its default.

ARTICLE 54. OTHER REMEDIES

54.1 In addition to the right to declare the **Contractor** in default pursuant to this Chapter X, the **Commissioner** shall have the absolute right, in his/her sole discretion and without a hearing, to complete or cause to be completed in the same manner as described in Articles 51 and 53, any or all unsatisfactory or uncompleted punch list **Work** that remains after the completion date specified in the **Final Approved Punch List**. A written notice of the exercise of this right shall be sent to the **Contractor** who shall immediately quit the **Site** in accordance with the provisions of Article 50.

54.2 The expense of completion permitted under Article 54.1, including any and all related and incidental costs, as so certified by the **Commissioner**, shall be charged against and deducted out of monies which have been earned by the **Contractor** prior to the date of the exercise of the right set forthin Article 54.1; the balance of such monies, if any, subject to the other provisions of this **Contract**, to be paid to the **Contractor** without interest after such completion. Should the expense of such completion,as certified by

the **Commissioner**, exceed the total sum which would have been payable under the **Contract** if it had been completed by the **Contractor**, any excess shall be paid by the **Contractor**.

54.3 The previous provisions of this Chapter X shall be in addition to any and all other remedies available under **Law** or in equity.

54.4 The exercise by the **City** of any remedy set forth herein shall not be deemed a waiver by the **City** of any other legal or equitable remedy contained in this **Contract** or provided under **Law**.

CHAPTER XI: MISCELLANEOUS PROVISIONS

ARTICLE 55. CONTRACTOR'S WARRANTIES

55.1 In consideration of, and to induce, the award of this **Contract** to the **Contractor**, the **Contractor** represents and warrants:

55.1.1 That it is financially solvent, sufficiently experienced and competent to performthe **Work**; and

55.1.2 That the facts stated in its bid and the information given by it pursuant to the Information for Bidders is true and correct in all respects; and

55.1.3 That it has read and complied with all requirements set forth in the **Contract**.

ARTICLE 56. CLAIMS AND ACTIONS THEREON

56.1 Any claim, that is not subject to dispute resolution under the **PPB** Rules or this **Contract**, against the **City** for damages for breach of **Contract** shall not be made or asserted in any action, unless the **Contractor** shall have strictly complied with all requirements relating to the giving of notice and of information with respect to such claims, as herein before provided.

56.2 Nor shall any action be instituted or maintained on any such claims unless such action is commenced within six (6) months after **Substantial Completion**; except that:

56.2.1 Any claims arising out of events occurring after **Substantial Completion** and before **Final Acceptance** of the **Work** shall be asserted within six (6) months of **Final Acceptance** of the **Work**;

56.2.2 If the **Commissioner** exercises his/her right to complete or cause to complete any or all unsatisfactory or uncompleted punch list **Work** that remains after the completion date specified in the **Final Approved Punch List** pursuant to Article 54, any such action shall be commenced within six (6) months from the date the **Commissioner** notifies the **Contractor** in writing that he/she has exercised such right. Any claims for monies deducted, retained or withheld under the provisions of this **Contract** shall be assertedwithin six (6) months after the date when such monies otherwise become due and payable hereunder; and

56.2.3 If the **Commissioner** exercises his/her right to terminate the **Contract** pursuant to Article 64, any such action shall be commenced within six (6) months of the date the **Commissioner** exercises said right.

ARTICLE 57. INFRINGEMENT

57.1 The **Contractor** shall be solely responsible for and shall defend, indemnify, and hold the **City** harmless from any and all claims (even if the allegations of the lawsuit are without merit) and judgments for damages and from costs and expenses to which the **City** may be subject to or which it may suffer or incur allegedly arising out of or in connection with any infringement by the **Contractor** of any copyright, trade secrets, trademark or patent rights or any other property or personal right of any third party by the **Contractor** and/or its **Subcontractors** in the performance or completion of the **Work**. Insofar as thefacts or **Law** relating to any claim would preclude the **City** from being completely indemnified by the **Contractor**, the **City** shall be partially indemnified by the **Contractor** to the fullest extent permitted by **Law**.

ARTICLE 58. NO CLAIM AGAINST OFFICIALS, AGENTS OR EMPLOYEES

58.1 No claim whatsoever shall be made by the **Contractor** against any official, agent or employeeof the **City** for, or on account of, anything done or omitted to be done in connection with this **Contract**.

ARTICLE 59. SERVICE OF NOTICES

59.1 The **Contractor** hereby designates the business address, fax number, and email addressspecified in its bid, as the place where all notices, directions or other communications to the **Contractor** may be delivered, or to which they may be mailed. Any notice, direction, or communication from either party to the other shall be in writing and shall be deemed to have been given when (i) delivered personally; (ii) sent by certified mail, return receipt requested; (iii) delivered by overnight or same day courier service in a properly addressed envelope with confirmation; or (iv) sent by fax or email and,unless receipt of the fax or e-mail is acknowledged by the recipient by fax or e-mail, deposited in a post office box regularly maintained by the United States Postal Service in a properly addressed, postage pre- paid envelope.

59.2 **Contractor's** notice address, email address, or fax number may be changed at any time by an instrument in writing, executed and acknowledged by the **Contractor**, and delivered to the**Commissioner**.

59.3 Nothing herein contained shall, however, be deemed to preclude or render inoperative the service of any notice, direction or other communication upon the **Contractor** personally, or, if the **Contractor** is a corporation, upon any officer thereof.

ARTICLE 60. UNLAWFUL PROVISIONS DEEMED STRICKEN FROM CONTRACT

60.1 If this **Contract** contains any unlawful provision not an essential part of the **Contract** and which shall not appear to have been a controlling or material inducement to the making thereof, the same shall be deemed of no effect and shall, upon notice by either party, be deemed stricken from the **Contract** without affecting the binding force of the remainder.

ARTICLE 61. ALL LEGAL PROVISIONS DEEMED INCLUDED

61.1 It is the intent and understanding of the parties to this **Contract** that each and every provision of **Law** required to be inserted in this **Contract** shall be and is inserted herein. Furthermore, it is hereby stipulated that every such provision is to be deemed to be inserted herein, and if, through mistake or otherwise, any such provision is not inserted, or is not inserted in correct form, then this **Contract** shall forthwith upon the application of either party be amended by such insertion so as to comply strictly with the **Law** and without prejudice to the rights of either party hereunder.

ARTICLE 62. TAX EXEMPTION

62.1 The **City** is exempt from payment of Federal, State, and local taxes, including sales and compensating use taxes of the State of New York and its cities and counties on all tangible personal property sold to the **City** pursuant to the provisions of this **Contract**. These taxes are not to be included in bids. However, this exemption does not apply to tools, machinery, equipment or other property leased by or to the **Contractor**, **Subcontractor** or **Materialman** or to tangible personal property which, even though it is consumed, is not incorporated into the completed **Work** (consumable supplies) and tangible personal property that the **Contractor** is required to remove from the **Site** during or upon completion of the **Work**. The **Contractor** and its **Subcontractors** and **Materialmen** shall be responsible for and pay any and all applicable taxes, including sales and compensating use taxes, on such leased tools, machinery, equipment or other property and upon all such consumable supplies and tangible personal property that the **Contractor** is required to remove from the **Site** during or upon completion of the **Work**.

62.2 The **Contractor** agrees to sell and the **City** agrees to purchase all tangible personal property, other than consumable supplies and other tangible personal property that the **Contractor** is required to remove from the **Site** during or upon completion of the **Work**, that is required, necessary or proper for or incidental to the construction of the **Project** covered by this **Contract**. The sum paid under this **Contract** for such tangible personal property shall be in full payment and consideration for the sale of such tangible personal property.

> 62.2.1 The **Contractor** agrees to construct the **Project** and to perform all **Work**, labor and services rendered, necessary, proper or incidental thereto for the sum shown in the bid forthe performance of such **Work**, labor, and services, and the sum so paid pursuant to this **Contract** for such **Work**, labor, and services, shall be in full consideration for the performance by the **Contractor** of all its duties and obligations under this **Contract** in connection with said **Work,** labor, and services.

62.3 20 NYCRR Section 541.3(d) provides that a **Contractor**'s purchases of tangible personal property that is either incorporated into real property owned by a governmental entity or purchased for and sold to a governmental entity are exempt from sales and use tax. The **City** shall not pay sales tax for any such tangible personal property that it purchases from the **Contractor** pursuant to the **Contract.** With respect to such tangible personal property, the **Contractor**, at the request of the **City**, shall furnish to the **City** such bills of sale and other instruments as may be required by the **City**, properly executed, acknowledged and delivered assuring to the **City** title to such tangible personal property, free of liens and/or encumbrances, and the **Contractor** shall mark or otherwise identify all such tangible personal property as the property of the **City**.

62.4 Title to all tangible personal property to be sold by the **Contractor** to the **City** pursuant to the provisions of the **Contract** shall immediately vest in and become the sole property of the **City** upon delivery of such tangible personal property to the **Site**. Notwithstanding such transfer of title, the **Contractor** shall

have the full and continuing responsibility to install such tangible personal property in accordance with the provisions of this **Contract**, protect it, maintain it in a proper condition and forthwith repair, replace and make good any damage thereto, theft or disappearance thereof, and furnish additional tangible personal property in place of any that may be lost, stolen or rendered unusable, without cost to the **City**, until such time as the **Work** covered by the **Contract** is fully accepted by the **City**. Such transfer of title shall in no way affect any of the **Contractor's** obligations hereunder. In the event that, after title has passed to the **City**, any of the tangible personal property is rejected as being defective or otherwise unsatisfactory, title to all such tangible personal property shall be deemed to have been transferred back to the **Contractor**.

62.5 The purchase by **Subcontractors** or **Materialmen** of tangible personal property to be sold hereunder shall be a purchase or procurement for resale to the **Contractor** (either directly or through other **Subcontractors**) and therefore not subject to the aforesaid sales and compensating use taxes, provided that the subcontracts and purchase agreements provide for the resale of such tangible personal property and that such subcontracts and purchase agreements are in a form similar to this **Contract** with respect to the separation of the sale of consumable supplies and tangible personal property that the **Contractor** is required to remove from the **Site** during or upon completion of the **Work** from the **Work** and labor, services, and any other matters to be provided, and provided further that the subcontracts and purchase agreements provide separate prices for tangible personal property and all other services and matters. Such separation shall actually be followed in practice, including the separation of payments for tangible personal property from the payments for other **Work** and labor and other things to be provided.

62.6 The **Contractor** and its **Subcontractors** and **Materialmen** shall furnish a **Contractor** Exempt Purchase Certificate to all persons, firms or corporations from which they purchase tangible personal property for the performance of the **Work** covered by this **Contract**.

62.7 In the event any of the provisions of this Article 62 shall be deemed to be in conflict with any other provisions of this **Contract** or create any ambiguity, then the provisions of this Article 62 shall control.

ARTICLE 63. INVESTIGATION(S) CLAUSE

63.1 The parties to this **Contract** agree to cooperate fully and faithfully with any investigation, audit or inquiry conducted by a United States, a State of New York (State) or a **City** governmental agency or authority that is empowered directly or by designation to compel the attendance of witnesses and to examine witnesses under oath, or conducted by the Inspector General of a governmental agency that is a party in interest to the transaction, submitted bid, submitted proposal, contract, lease, permit or license that is the subject of the investigation, audit or inquiry.

63.2 If any person who has been advised that his/her statement, and any information from such statement, will not be used against him/her in any subsequent criminal proceeding refuses to testify before a grand jury or other governmental agency or authority empowered directly or by designation to compel the attendance of witnesses and to examine witnesses under oath concerning the award of or performance under any transaction, agreement, lease, permit, contract, or license entered into with the **City**, the State, or any political subdivision or public authority thereof, or the Port Authority of NewYork and New Jersey, or any local development corporation within the **City**, or any public benefit corporation organized under the **Laws** of the State of New York, or;

63.3 If any person refuses to testify for a reason other than the assertion of his/her privilege against self incrimination in an investigation, audit or inquiry conducted by a **City** or State governmental agency or authority empowered directly or by designation to compel the attendance of witnesses and to take testimony under oath, or by the Inspector General of the governmental agency that is a party in interestin, and is

seeking testimony concerning the award of, or performance under any transaction, agreement, lease, permit, contract, or license entered into with the **City**, the State, or any political subdivision thereof or any local development corporation within the **City**, then;

63.4 The **Commissioner** whose **Agency** is a party in interest to the transaction, submitted bid, submitted proposal, contract, lease, permit, or license shall convene a hearing, upon not less than five (5) **Days**' written notice to the parties involved to determine if any penalties should attach for the failure of a person to testify.

63.5 If any non-governmental party to the hearing requests an adjournment, the **Commissioner** who convened the hearing may, upon granting the adjournment, suspend any contract, lease, permit, or license, pending the final determination pursuant to Article 63.7 without the **City** incurring any penalty or damages for delay or otherwise.

63.6 The penalties which may attach after a final determination by the **Commissioner** may include but shall not exceed:

63.6.1 The disqualification for a period not to exceed five (5) years from the date of an adverse determination for any person, or any entity of which such person was a member at the time the testimony was sought, from submitting bids for, or transacting business with, or entering into or obtaining any contract, lease, permit or license with or from the **City**; and/or

63.6.2 The cancellation or termination of any and all such existing **City** contracts, leases, permits or licenses that the refusal to testify concerns and that have not been assigned as permitted under this **Contract**, nor the proceeds of which pledged, to an unaffiliated and unrelated institutional lender for fair value prior to the issuance of the notice scheduling the hearing, without the **City** incurring any penalty or damages on account of such cancellation or termination; monies lawfully due for goods delivered, work done, rentals, or fees accrued prior to the cancellation or termination shall be paid by the **City**.

63.7 The **Commissioner** shall consider and address in reaching his/her determination and inassessing an appropriate penalty the factors in Articles 63.7.1 and 63.7.2. The **Commissioner** may also consider, if relevant and appropriate, the criteria established in Articles 63.7.3 and 63.7.4, in addition to any other information which may be relevant and appropriate:

63.7.1 The party's good faith endeavors or lack thereof to cooperate fully and faithfully with any governmental investigation or audit, including but not limited to the discipline, discharge, or disassociation of any person failing to testify, the production of accurate and complete books and records, and the forthcoming testimony of all other members, agents, assignees or fiduciaries whose testimony is sought.

63.7.2 The relationship of the person who refused to testify to any entity that is a party tothe hearing, including but not limited to, whether the person whose testimony is sought has an ownership interest in the entity and/or the degree of authority and responsibility theperson has within the entity.

63.7.3 The nexus of the testimony sought to the subject entity and its contracts, leases, permits or licenses with the **City**.

63.7.4 The effect a penalty may have on an unaffiliated and unrelated party or entity thathas a significant interest in an entity subject to penalties under Article 63.6, provided that the party

or entity has given actual notice to the **Commissioner** upon the acquisition of the interest, or at the hearing called for in Article 63.4, gives notice and proves that such interest was previously acquired. Under either circumstance the party or entity shall present evidence at the hearing demonstrating the potential adverse impact a penalty will have on such person or entity.

63.8 Definitions:

63.8.1 The term "license" or "permit" as used in this Article 63 shall be defined as a license, permit, franchise or concession not granted as a matter of right.

63.8.2 The term "person" as used in this Article 63 shall be defined as any natural person doing business alone or associated with another person or entity as a partner, director, officer, principal or employee.

63.8.3 The term "entity" as used in this Article 63 shall be defined as any firm, partnership, corporation, association, joint venture, or person that receives monies, benefits, licenses, leases, or permits from or through the **City** or otherwise transacts business with the **City**.

63.8.4 The term "member" as used in this Article 63 shall be defined as any person associated with another person or entity as a partner, director, officer, principal or employee.

63.9 In addition to and notwithstanding any other provision of this **Contract**, the **Commissioner** may in his/her sole discretion terminate this **Contract** upon not less than three (3) **Days'** written notice in the event the **Contractor** fails to promptly report in writing to the **Commissioner** of the Department of Investigations ("DOI") of the **City** any solicitation of money, goods, requests for future employment or other benefit or thing of value, by or on behalf of any employee of the **City** or other person, firm, corporation or entity for any purpose which may be related to the procurement or obtaining of this **Contract** by the **Contractor**, or affecting the performance of this **Contract**.

ARTICLE 64. TERMINATION BY THE CITY

64.1 In addition to termination pursuant to any other article of this **Contract**, the **Commissioner** may, at any time, terminate this **Contract** by written notice to the **Contractor**. In the event of termination, the **Contractor** shall, upon receipt of such notice, unless otherwise directed by the **Commissioner**:

64.1.1 Stop **Work** on the date specified in the notice;

64.1.2 Take such action as may be necessary for the protection and preservation of the **City's** materials and property;

64.1.3 Cancel all cancelable orders for material and equipment;

64.1.4 Assign to the **City** and deliver to the **Site** or another location designated by the **Commissioner**, any non-cancelable orders for material and equipment that is not capable of use except in the performance of this **Contract** and has been specifically fabricated for the sole purpose of this **Contract** and not incorporated in the **Work**;

64.1.5 Take no action which will increase the amounts payable by the **City** under this
64.1.5 **Contract**.

64.2 In the event of termination by the **City** pursuant to this Article 64, payment to the **Contractor** shall be in accordance with Articles 64.2.1, 64.2.2 or 64.2.3, to the extent that each respective article applies.

64.2.1 Lump Sum Contracts or Items: On all lump sum **Contracts**, or on lump sum items in a **Contract**, the **City** will pay the **Contractor** the sum of the amounts described in Articles 64.2.1(a) and 64.2.1(b), less all payments previously made pursuant to this **Contract**. On lump sum **Contracts** only, the **City** will also pay the **Contractor** an additional sum as provided in Article 64.2.1(c).

64.2.1(a) For **Work** completed prior to the notice of termination, the **Contractor** shall be paid a pro rata portion of the lump sum bid amount, plus approved change orders, based upon the percent completion of the **Work**, as determined by the **Commissioner**. For the purpose of determining the pro rata portion of the lump sum bid amount to which the **Contractor** is entitled, the bid breakdown submitted in accordance with Article 41 shall be considered, but shall not be dispositive. The **Commissioner's** determination hereunder shall be final, binding, and conclusive.

64.2.1(b) For non-cancelable material and equipment that is not capable of use except in the performance of this **Contract** and has been specifically fabricated for the sole purpose of this **Contract**, but not yet incorporated in the **Work**, the **Contractor** shall be paid the lesser of the following, less salvage value:

64.2.1(b)(i) The Direct Cost, as defined in Article 64.2.4; or

64.2.1(b)(ii) The fair and reasonable value, if less than Direct Cost, of such material and equipment, plus necessary and reasonable delivery costs.

64.2.1(b)(iii) In addition, the **Contractor** shall be paid five (5%) percent of the amount described in Article 64.2.1(b)(i) or Article 64.2.1(b)(ii), whichever applies.

64.2.1(c) Except as otherwise provided in Article 64.2.1(d), on all lump sum **Contracts**, the **Contractor** shall be paid the percentage indicated below applied tothe difference between the total lump sum bid amount and the total of all payments made prior to the notice of termination plus all payments allowed pursuant to Articles 64.2.1(a) and 64.2.1(b):

64.2.1(c)(i) Five (5%) percent of the first five million ($5,000,000) dollars; and

64.2.1(c)(ii) Three (3%) percent of any amount between five million ($5,000,000) dollars and fifteen million ($15,000,000) dollars; plus

64.2.1(c)(iii) One (1%) percent of any amount over fifteen million ($15,000,000) dollars.

64.2.1(d) In the event the **City** terminates a lump sum **Contract** pursuant to this Article 64 within ninety (90) **Days** after registration of the **Contract** with the **Comptroller**, the **Contractor** shall be paid one (1%) percent of the difference between the lump sum bid amount and the total of all payments made pursuant to this Article 64.2.

64.2.2 Unit Price Contracts or Items: On all unit price **Contracts**, or on unit price items ina

Contract, the **City** will pay the **Contractor** the sum of the amounts described in Articles 64.2.2(a) and 64.2.2(b), less all payments previously made pursuant to this **Contract**:

64.2.2(a) For all completed units, the unit price stated in the **Contract**, and

64.2.2(b) For units that have been ordered but are only partially completed, the **Contractor** will be paid:

64.2.2(b)(i) A pro rata portion of the unit price stated in the **Contract** based upon the percent completion of the unit and

64.2.2(b)(ii) For non-cancelable material and equipment, payment willbe made pursuant to Article 64.2.1(b).

64.2.3 Time and Materials Contracts or Items Based on Time and Material Records: On all **Contracts** or items in a **Contract** where payment for the **Work** is based on time and material records, the **Contractor** shall be paid in accordance with Article 26, less all payments previously made pursuant to this **Contract**.

64.2.4 Direct Costs: Direct Costs as used in this Article 64.2 shall mean:

64.2.4(a) The actual purchase price of material and equipment, plus necessary and reasonable delivery costs,

64.2.4(b) The actual cost of labor involved in construction and installation at the **Site**, and

64.2.4(c) The actual cost of necessary bonds and insurance purchased pursuant to requirements of this **Contract** less any amounts that have been or should be refunded by the **Contractor's** sureties or insurance carriers.

64.2.4(d) Direct Costs shall not include overhead.

64.3 In no event shall any payments under this Article 64 exceed the **Contract** price for such items.

64.4 All payments pursuant to Article 64 shall be in the nature of liquidated damages and shall be accepted by the **Contractor** in full satisfaction of all claims against the **City**.

64.5 The **City** may deduct or set off against any sums due and payable pursuant to this Article 64, any deductions authorized by this **Contract** or by **Law** (including but not limited to liquidated damages) and any claims it may have against the **Contractor**. The **City's** exercise of the right to terminate the **Contract** pursuant to this Article 64 shall not impair or otherwise effect the **City's** right to assert any claims it may have against the **Contractor** in a plenary action.

64.6 Where the **Work** covered by the **Contract** has been substantially completed, as determined in writing by the **Commissioner**, termination of the **Work** shall be handled as an omission of **Work** pursuant to Articles 29 and 33, in which case a change order will be issued to reflect an appropriate reduction in the **Contract** sum, or if the amount is determined after final payment, such amount shall be paid by the **Contractor**.

ARTICLE 65. CHOICE OF LAW, CONSENT TO JURISDICTION AND VENUE

65.1 This **Contract** shall be deemed to be executed in the **City** regardless of the domicile of the **Contractor**, and shall be governed by and construed in accordance with the **Laws** of the State of New York and the **Laws** of the United States, where applicable.

65.2 The parties agree that any and all claims asserted against the **City** arising under this **Contract** or related thereto shall be heard and determined in the courts of the State of New York ("New York State Courts") located in the **City** and County of New York. To effect this **Contract** and intent, the **Contractor** agrees:

65.2.1 If the **City** initiates any action against the **Contractor** in Federal court or in a New York State Court, service of process may be made on the **Contractor** either in person, wherever such **Contractor** may be found, or by registered mail addressed to the **Contractor** at its address as set forth in this **Contract**, or to such other address as the **Contractor** may provide to the **City** in writing; and

65.2.2 With respect to any action between the **City** and the **Contractor** in a New York State Court, the **Contractor** hereby expressly waives and relinquishes any rights it might otherwise have:

65.2.2(a) To move to dismiss on grounds of forum non conveniens;

65.2.2(b) To remove to Federal Court; and

65.2.2(c) To move for a change of venue to a New York State Court outside New York County.

65.2.3 With respect to any action brought by the **City** against the **Contractor** in a Federal Court located in the **City**, the **Contractor** expressly waives and relinquishes any right it might otherwise have to move to transfer the action to a Federal Court outside the **City**.

65.2.4 If the **Contractor** commences any action against the **City** in a court located other than in the **City** and County of New York, upon request of the **City**, the **Contractor** shall either consent to a transfer of the action to a New York State Court of competent jurisdiction located in the **City** and County of New York or, if the Court where the action is initially brought will not or cannot transfer the action, the **Contractor** shall consent to dismiss such action without prejudice and may thereafter reinstate the action in a New York State Court of competent jurisdiction in New York County.

65.3 If any provision(s) of this Article 65 is held unenforceable for any reason, each and all other provision(s) shall nevertheless remain in full force and effect.

ARTICLE 66. PARTICIPATION IN AN INTERNATIONAL BOYCOTT

66.1 The **Contractor** agrees that neither the **Contractor** nor any substantially owned affiliated company is participating or shall participate in an international boycott in violation of the provisions ofthe Federal Export Administration Act of 1979, as amended, or the regulations of the United States Department of Commerce (Commerce Department) promulgated thereunder.

66.2 Upon the final determination by the Commerce Department or any other agency of the United States as to, or conviction of the **Contractor** or a substantially-owned affiliated company thereof for participation in an international boycott in violation of the provisions of the Export Administration Act of 1979, as amended, or the regulations promulgated thereunder, the **Comptroller** may, at his/her option, render forfeit and void this **Contract**.

66.3 The **Contractor** shall comply in all respects, with the provisions of Section 6-114 of the Administrative Code and the rules and regulations issued by the **Comptroller** thereunder.

ARTICLE 67. LOCALLY BASED ENTERPRISE PROGRAM

67.1 This **Contract** is subject to the requirements of Section 6-108.1 of the Administrative Code and regulations promulgated thereunder. No construction contract shall be awarded unless and until these requirements have been complied with in their entirety; however, compliance with this Article 67 is not required if the Agency sets Subcontractor Participation Goals for Minority- and Women-Owned Business Enterprises (M/WBEs).

67.2 Unless specifically waived by the **Commissioner** with the approval of the Division of Economic and Financial Opportunity of the **City** Department of Business Services, if any portion of the **Contract** is subcontracted, not less than ten (10%) percent of the total dollar amount of the **Contract** shall be awarded to locally based enterprises (LBEs); except that where less than ten (10%) percent of the total dollar amount of the **Contract** is subcontracted, such lesser percentage shall be so awarded.

67.3 The **Contractor** shall not require performance and payment bonds from LBE **Subcontractors**.

67.4 If the **Contractor** has indicated prior to award that no **Work** will be subcontracted, no **Work** shall be subcontracted without the prior approval of the **Commissioner**, which shall be granted only ifthe **Contractor** makes a good faith effort beginning at least six (6) weeks before the **Work** is to be performed to obtain LBE **Subcontractors** to perform the **Work**.

67.5 If the **Contractor** has not identified sufficient LBE **Subcontractors** prior to award, it shall sign a letter of compliance stating that it complies with Section 6-108.1 of the Administrative Code, recognizes that achieving the LBE requirement is a condition of its **Contract**, and shall submit documentation demonstrating its good faith efforts to obtain LBEs. After award, the **Contractor** shall begin to solicit LBE's to perform subcontracted **Work** at least six (6) weeks before the date such **Work**is to be performed and shall demonstrate that a good faith effort has been made to obtain LBEs on each subcontract until it meets the required percentage.

67.6 Failure of the **Contractor** to comply with the requirements of Section 6-108.1 of the Administrative Code and the regulations promulgated thereunder shall constitute a material breach of this **Contract**. Remedy for such breach may include the imposition of any or all of the following sanctions:

67.6.1 Reducing the **Contractor's** compensation by an amount equal to the dollar value ofthe percentage of the LBE subcontracting requirement not complied with;

67.6.2 Declaring the **Contractor** in default;

67.6.3 If the **Contractor** is an LBE, de-certifying and declaring the **Contractor** ineligibleto participate in the LBE program for a period of up to three (3) years.

ARTICLE 68. ANTITRUST

68.1 The **Contractor** hereby assigns, sells, and transfers to the **City** all right, title, and interest in and to any claims and causes of action arising under the antitrust **Laws** of New York State or of the United States relating to the particular goods or services purchased or procured by the **City** under this **Contract**.

ARTICLE 69. MacBRIDE PRINCIPLES PROVISIONS

69.1 Notice To All Prospective **Contractors**:

69.1.1 Local Law No. 34 of 1991 became effective on September 10, 1991 and added Section 6-115.1 of the Administrative Code. The local **Law** provides for certain restrictions on **City Contracts** to express the opposition of the people of the **City** to employment discrimination practices in Northern Ireland to promote freedom of work-place opportunity.

69.1.2 Pursuant to Section 6-115.1, prospective **Contractors** for **Contracts** to provide goods or services involving an expenditure of an amount greater than ten thousand ($10,000.) dollars, or for construction involving an amount greater than fifteen thousand ($15,000.) dollars, are asked to sign a rider in which they covenant and represent, as a material condition of their **Contract**, that any business operations in Northern Ireland conducted by the **Contractor** and any individual or legal entity in which the **Contractor** holds a ten (10%) percent or greater ownership interest in the **Contractor** will be conducted in accordance with the MacBride Principles of nondiscrimination in employment.

69.1.3 Prospective **Contractors** are not required to agree to these conditions. However, in the case of **Contracts** let by competitive sealed bidding, whenever the lowest responsible bidder has not agreed to stipulate to the conditions set forth in this notice and another bidder who has agreed to stipulate to such conditions has submitted a bid within five (5%) percent of the lowest responsible bid for a **Contract** to supply goods, services or contraction of comparable quality, the **Agency** shall refer such bids to the Mayor, the Speaker or other officials, as appropriate, who may determine, in accordance with applicable **Law**, that it is in the best interest of the **City** that the **Contract** be awarded to other than the lowest responsible pursuant to Section 313(b)(2) of the **City** Charter.

69.1.4 In the case of **Contracts** let by other than competitive sealed bidding, if a prospective **Contractor** does not agree to these conditions, no **Agency**, elected official or the **City** Council shall award the **Contract** to that bidder unless the **Agency** seeking to use the goods, services or construction certifies in writing that the **Contract** is necessary for the **Agency** to perform its functions and there is no other responsible **Contractor** who will supply goods, services or construction of comparable quality at a comparable price.

69.2 In accordance with Section 6-115.1 of the Administrative Code, the **Contractor** stipulates that such **Contractor** and any individual or legal entity in which the **Contractor** holds a ten (10%) percent or greater ownership interest in the **Contractor** either:

69.2.1 Have no business operations in Northern Ireland, or

69.2.2 Shall take lawful steps in good faith to conduct any business operations they have in

Northern Ireland in accordance with the MacBride Principles, and shall permit independent monitoring of their compliance with such principles.

69.3 For purposes of this Article, the following terms shall have the following meanings:

69.3.1 "MacBride Principles" shall mean those principles relating to nondiscrimination in employment and freedom of work-place opportunity which require employers doing business in Northern Ireland to:

69.3.1(a) increase the representation of individuals from under-represented religious groups in the workforce, including managerial, supervisory, administrative, clerical and technical jobs;

69.3.1(b) take steps to promote adequate security for the protection of employees from under-represented religious groups both at the work-place and while traveling toand from **Work**;

69.3.1(c) ban provocative religious or political emblems from the workplace;

69.3.1(d) publicly advertise all job openings and make special recruitment efforts to attract applicants from under-represented religious groups;

69.3.1(e) establish layoff, recall, and termination procedures which do not in practice favor a particular religious group;

69.3.1(f) abolish all job reservations, apprenticeship restrictions and different employment criteria which discriminate on the basis of religion;

69.3.1(g) develop training programs that will prepare substantial numbers of current employees from under-represented religious groups for skilled jobs, including the expansion of existing programs and the creation of new programs to train, upgrade, and improve the skills of workers from under-represented religious groups;

69.3.1(h) establish procedures to asses, identify, and actively recruit employees from under-represented religious groups with potential for further advancement; and

69.3.1(i) appoint a senior management staff member to oversee affirmative actionefforts and develop a timetable to ensure their full implementation.

69.4 The **Contractor** agrees that the covenants and representations in Article 69.2 are material conditions to this **Contract**. In the event the **Agency** receives information that the **Contractor** who made the stipulation required by this Article 69 is in violation thereof, the **Agency** shall review such information and give the **Contractor** an opportunity to respond. If the **Agency** finds that a violation has occurred, the **Agency** shall have the right to declare the **Contractor** in default in default and/or terminate this **Contract** for cause and procure supplies, services or **Work** from another source in the manner the **Agency** deems proper. In the event of such termination, the **Contractor** shall pay to the **Agency**, or the **Agency** in its sole discretion may withhold from any amounts otherwise payable to the **Contractor**, the difference between the **Contract** price for the uncompleted portion of this **Contract** and the cost to the **Agency** of completing performance of this **Contract** either itself or by engaging another **Contractor** or **Contractors**. In the case of a requirement **Contract**, the **Contractor** shall be liable for such difference in price for the entire amount of supplies required by the **Agency** for the uncompleted term of **Contractor's Contract**. In the case of a construction **Contract**, the **Agency** shall also have the right to hold the **Contractor** in partial or total default in

accordance with the default provisions of this **Contract**, and/or may seek debarment or suspension of the **Contractor**. The rights and remedies of the **Agency** hereunder shall be in addition to, and not in lieu of, any rights and remedies the **Agency** has pursuant to this **Contract** or by operation of **Law**.

ARTICLE 70. ELECTRONIC FILING/NYC DEVELOPMENT HUB

70.1 The **Contractor** shall electronically file all alteration type-2 and alteration type-3 applications via the New York City Development Hub Web site, except applications for the following types of minor alterations: enlargements, curb cuts, legalizations, fire alarms, builders pavement plans, and jobs filed on Landmark Preservation Commission calendared properties. All such filings must be professionally certified. Information about electronic filing via the New York City Development Hub is available on the **City** Department of Buildings Web site at www.nyc.gov/buildings.

ARTICLE 71. PROHIBITION OF TROPICAL HARDWOODS

71.1 Tropical hardwoods, as defined in Section 165 of the New York State Finance Law (Finance Law), shall not be utilized in the performance of this **Contract** except as expressly permitted by Section 165 of the Finance Law.

ARTICLE 72. CONFLICTS OF INTEREST

72.1 Section 2604 of the **City** Charter and other related provisions of the **City** Charter, the Administrative Code, and the Penal Law are applicable under the terms of this **Contract** in relation to conflicts of interest and shall be extended to **Subcontractors** authorized to perform **Work**, labor and services pursuant to this **Contract** and further, it shall be the duty and responsibility of the **Contractor**to so inform its respective **Subcontractors**. Notice is hereby given that, under certain circumstances, penalties may be invoked against the donor as well as the recipient of any form of valuable gift.

ARTICLE 73. MERGER CLAUSE

73.1 The written **Contract** herein, contains all the terms and conditions agreed upon by the parties hereto, and no other agreement, oral or otherwise, regarding the subject matter of this **Contract** shall be deemed to exist or to bind any of the parties hereto, or to vary any of the terms contained herein.

ARTICLE 74. STATEMENT OF WORK

74.1 The **Contractor** shall furnish all labor and materials and perform all **Work** in strictaccordance with the **Specifications** and **Addenda** thereto, numbered as shown in Schedule A.

ARTICLE 75. COMPENSATION TO BE PAID TO CONTRACTOR

75.1 The **City** will pay and the **Contractor** will accept in full consideration for the performance of the **Contract**, subject to additions and deductions as provided herein, the total sum shown in Schedule A, this said sum being the amount at which the **Contract** was awarded to the **Contractor** at a public letting thereof, based upon the **Contractor's** bid for the **Contract**.

ARTICLE 76. ELECTRONIC FUNDS TRANSFER

76.1 In accordance with Section 6-107.1 of the Administrative Code, the **Contractor** agrees to accept payments under this **Contract** from the **City** by electronic funds transfer (EFT). An EFT is any transfer of funds, other than a transaction originated by check, draft or similar paper instrument, which is initiated through an electronic terminal, telephonic instrument or computer or magnetic tape so as to order, instruct or authorize a financial institution to debit or credit an account. Prior to the first payment made under this **Contract**, the **Contractor** shall designate one financial institution or other authorized payment agent and shall complete the attached "EFT Vendor Payment Enrollment Form" in order to provide the Commissioner of the **City** Department of Finance with information necessary for the **Contractor** to receive electronic funds transfer payments through a designated financial institution or authorized payment agent. The crediting of the amount of a payment to the appropriate account on the books of a financial institution or other authorized payment agent designated by the **Contractor** shall constitute full satisfaction by the **City** for the amount of the payment under this **Contract**. The account information supplied by the **Contractor** to facilitate the electronic funds transfer shall remain confidential to the fullest extent provided by **Law**.

76.2 The **Commissioner** may waive the application of the requirements of this Article 76 to payments on contracts entered into pursuant to Section 315 of the **City** Charter. In addition, the Commissioner of the Department of Finance and the Comptroller may jointly issue standards pursuant to which the **Agency** may waive the requirements of this Article 76 for payments in the following circumstances: (i) for individuals or classes of individuals for whom compliance imposes a hardship; (ii) for classifications or types of checks; or (iii) in other circumstances as may be necessary in the interest of the **City**.

ARTICLE 77. RECORDS RETENTION

77.1 The **Contractor** agrees to retain all books, records, and other documents relevant to this **Contract** for six years after the final payment or termination of this **Contract**, whichever is later. **City**, state, and federal auditors and any other persons duly authorized by the **City** shall have full access to and the right to examine any such books, records, and other documents during the retention period.

ARTICLE 78. EXAMINATION AND VIEWING OF SITE, CONSIDERATION OF OTHER SOURCES OF INFORMATION AND CHANGED SITE CONDITIONS

78.1 Pre-Bidding (Investigation) Viewing of Site – Bidders must carefully view and examine the **Site** of the proposed **Work**, as well as its adjacent area, and seek other usual sources of information, for they will be conclusively presumed to have full knowledge of any and all conditions and hazards on, about or above the **Site** relating to or affecting in any way the performance of the **Work** to be done under the **Contract** that were or should have been known by a reasonably prudent bidder. To arrange a date for visiting the **Site**,

bidders are to contact the **Agency** contact person specified in the bid documents.

78.2 Should the **Contractor** encounter during the progress of the Work site conditions or environmental hazards at the **Site** materially differing from any shown on the **Contract Drawings** or indicated in the **Specifications** or such conditions or environmental hazards as could not reasonablyhave been anticipated by the **Contractor**, which conditions or hazards will materially affect the cost of the **Work** to be done under the **Contract**, the attention of the **Commissioner** must be called immediately to such conditions or hazards before they are disturbed. The **Commissioner** shall thereupon promptly investigate the conditions or hazards. If the **Commissioner** finds that they do so materially differ, and that they could not have been reasonably anticipated by the **Contractor**, the **Contract** may be modified with the **Commissioner**'s written approval.

ARTICLE 79. PARTICIPATION BY MINORITY-OWNED AND WOMEN-OWNED BUSINESS ENTERPRISES IN CITY PROCUREMENT

ARTICLE I. M/WBE PROGRAM

Section 6-129 of the Administrative Code of the City of New York ("Section 6-129") establishes the program for participation in City procurement ("M/WBE Program") by minority- owned business enterprises ("MBEs") and women-owned business enterprises ("WBEs"), certified in accordance with Section 1304 of the New York City Charter. As stated in Section 6- 129, the intent of the program is to address the impact of discrimination on the City's procurement process, and to promote the public interest in avoiding fraud and favoritism in the procurement process, increasing competition for City business, and lowering contract costs. The contract provisions contained herein are pursuant to Section 6-129, and the rules of the Department of Small Business Services ("DSBS") promulgated thereunder.

If this Contract is subject to the M/WBE Program established by Section 6-129, the specific requirements of MBE and/or WBE participation for this Contract are set forth in Schedule B of the Contract (entitled the "M/WBE Utilization Plan") and are detailed below.

The Contractor must comply with all applicable MBE and WBE requirements for this Contract.

All provisions of Section 6-129 are hereby incorporated in the Contract by reference and all terms used herein that are not defined herein shall have the meanings given such terms in Section 6-129.

References to MBEs or WBEs shall also include such businesses certified pursuant to the executive law where credit is required by section 311 of the New York City Charter or other provision of law.

Article I, Part A, below, sets forth provisions related to the participation goals for construction, standard and professional services contracts.

Article I, Part B, below, sets forth miscellaneous provisions related to the M/WBE Program.

PART A: PARTICIPATION GOALS FOR CONSTRUCTION, STANDARD AND PROFESSIONAL SERVICES CONTRACTS OR TASK ORDERS

1. The MBE and/or WBE Participation Goals established for this Contract or Task Orders issued pursuant to this Contract, ("Participation Goals"), as applicable, are set forth on Schedule B, Part 1 to this Contract (see Page 1, Line 1 Total Participation Goals) or will be set forth on Schedule B, Part 1 to Task Orders issued pursuant to this Contract, as applicable.

The Participation Goals represent a percentage of the total dollar value of the Contract or Task Order, as applicable, that may be achieved by awarding subcontracts to firms certified with DSBS as MBEs and/or WBEs, and/or by crediting the participation of prime contractors and/or qualified joint ventures as provided in Section 3 below, unless the goals have been waived or modified by Agency in accordance with Section 6-129 and Part A, Sections 10 and 11 below, respectively.

2. If Participation Goals have been established for this Contract or Task Orders issued pursuant to this Contract, Contractor agrees or shall agree as a material term of the Contract that Contractor shall be subject to the Participation Goals, unless the goals are waived or modified by Agency in accordance with Section 6-129 and Part A, Sections 10 and 11 below, respectively.

3. If Participation Goals have been established for this Contract or Task Order issued pursuant to this Contract, a Contractor that is an MBE and/or WBE shall be permitted to count its own participation toward fulfillment of the relevant Participation Goal, provided that in accordance with Section 6-129 the value of Contractor's participation shall be determined by subtracting from the total value of the Contract or Task Order, as applicable, any amounts that the Contractor pays to direct subcontractors (as defined in Section 6-129(c)(13)), and provided further that a Contractor that is certified as both an MBE and a WBE may count its own participation either toward the goal for MBEs or the goal for WBEs, but not both.

A Contractor that is a qualified joint venture (as defined in Section 6-129(c)(30)) shall be permitted to count a percentage of its own participation toward fulfillment of the relevant Participation Goal. In accordance with Section 6-129, the value of Contractor's participation shall be determined by subtracting from the total value of the Contract or Task Order, as applicable, any amounts that Contractor pays to direct subcontractors, and then multiplying the remainder by the percentage to be applied to total profit to determine the amount to which an MBE or WBE is entitled pursuant to the joint venture agreement, provided that where a participant in a joint venture is certified as both an MBE and a WBE, such amount shall be counted either toward the goal for MBEs or the goal for WBEs, but not both.

4. A. If Participation Goals have been established for this Contract, a prospective contractor shall be required to submit with its bid or proposal, as applicable, a completed Schedule B, M/WBE Utilization Plan, Part 2 (see Pages1-2) indicating: (a) whether the contractor is an MBE or WBE, or qualified joint venture; (b) the percentage of work it intends to award to direct subcontractors; (c) in cases where the contractor intends to award direct subcontracts, a description of the type and dollar value of work designated for participation by MBEs and/or WBEs, and the time frames in which such work is scheduled to begin and end; as well as the name, addresses, and telephone numbers of the M/WBE subcontractors if required by the solicitation; and (d) the prospective contractor's required certification and affirmations. In the event that this M/WBE Utilization Plan indicates that the bidder or proposer, as applicable, does not intend to meet the Participation Goals, the bid or proposal, as applicable, shall be deemed non-responsive, unless Agency has granted the bidder or proposer, as applicable, a pre-award waiver of the Participation Goals in accordance with Section 6-129 and Part A, Section 10 below.

B. (i) If this Contract is for a master services agreement or other requirements type contract that will result in the issuance of Task Orders that will be individually registered ("Master Services Agreement") and is subject to M/WBE Participation Goals, a prospective contractor shall be required to submit with its bid or proposal, as applicable, a completed Schedule B, M/WBE Participation Requirements for Master Services Agreements That Will Require Individually Registered Task Orders, Part 2 (page 2) indicating the prospective contractor's certification and required affirmations to make all reasonable good faith efforts to meet participation goals established on each individual Task Order issued pursuant to this Contract, or if a partial waiver is obtained or such goals are modified by the Agency, to meet the modified Participation Goals by soliciting and obtaining the participation of certified MBE and/or WBE firms. In the event that the Schedule B indicates that the bidder or proposer, as applicable, does not intend to meet the Participation Goals that may be established on Task Orders issued pursuant to this Contract, the bid or proposal, as applicable, shall be deemed non- responsive.

(ii) Participation Goals on a Master Services Agreement will be established for individual Task Orders issued after the Master Services Agreement is awarded. If Participation Goals have been established on a Task Order, a contractor shall be required to submit a Schedule B – M/WBE Utilization Plan For Independently Registered Task Orders That Are Issued Pursuant to Master Services Agreements, Part 2 (see Pages 1-2) indicating: (a) whether the contractor is an MBE or WBE, or qualified joint venture; (b) the percentage of work it intends to award to direct subcontractors; (c) in cases where the contractor intends to award direct subcontracts, a description of the type and dollar value of work designated for participation by MBEs and/or WBEs, and the time frames in which such work is scheduled to begin and end; as well as the name, addresses, and telephone numbers of the M/WBE subcontractors if required by the solicitation; and (d) the prospective contractor's required certification and affirmations. The contractor must engage in good faith efforts to meet the Participation Goals as established for the Task Order unless Agency has granted the contractor a pre-award waiver of the Participation Goals in accordance with Section 6-129 and Part A, Section 10 below.

C. THE BIDDER/PROPOSER MUST COMPLETE THE SCHEDULE B INCLUDED HEREIN (SCHEDULE B, PART 2). A SCHEDULE B SUBMITTED BY THE BIDDER/PROPOSER WHICH DOES NOT INCLUDE THE VENDOR CERTIFICATION AND REQUIRED AFFIRMATIONS WILL BE DEEMED TO BE NON-RESPONSIVE, UNLESS A FULL WAIVER OF THE PARTICIPATION GOALS IS GRANTED (SCHEDULE B, PART 3). IN THE EVENT THAT THE CITY DETERMINES THAT THE BIDDER/PROPOSER HAS SUBMITTED A SCHEDULE B WHERE THE VENDOR CERTIFICATION AND REQUIRED AFFIRMATIONS ARE COMPLETED BUT OTHER ASPECTS OF THE SCHEDULE B ARE NOT COMPLETE, OR CONTAIN A COPY OR COMPUTATION ERROR THAT IS AT ODDS WITH THE VENDOR CERTIFICATION AND AFFIRMATIONS, THE BIDDER/PROPOSER WILL BE NOTIFIED BY THE AGENCY AND WILL BE GIVEN FOUR (4) CALENDAR DAYS FROM RECEIPT OF NOTIFICATION TO CURE THE SPECIFIED DEFICIENCIES AND RETURN A COMPLETED SCHEDULE B TO THE AGENCY. FAILURE TO DO SO WILL RESULT IN A DETERMINATION THAT THE BID/PROPOSAL IS NON-RESPONSIVE. RECEIPT OF NOTIFICATION IS DEFINED AS THE DATE NOTICE IS E-MAILED OR FAXED (IF THE BIDDER/PROPOSER HAS PROVIDED AN E-MAIL ADDRESS OR FAX NUMBER), OR NO LATER THAN FIVE (5) CALENDAR DAYS FROM THE DATE OF MAILING OR UPON DELIVERY, IF DELIVERED.

5. Where an M/WBE Utilization Plan has been submitted, the Contractor shall, within 30 days of issuance by Agency of a notice to proceed, submit a list of proposed persons or entities to which it intends to award subcontracts within the subsequent 12 months. In the case of multi- year contracts, such list shall also be submitted every year thereafter. The Agency may also require the Contractor to report periodically about the contracts awarded by its direct subcontractors to indirect subcontractors (as defined in Section 6-129(c)(22)). PLEASE NOTE: If this Contract is a public works project subject to GML §101(5) (i.e., a contract valued at or below $3M for projects in New York City) or if the Contract is subject to a project labor agreement in accordance with Labor Law §222, and the bidder is required to identify at the time of bid submission its intended subcontractors for the Wicks trades (plumbing and gas fitting; steam heating, hot water heating, ventilating and air conditioning (HVAC); and electric wiring), the Contractor must identify all those to which it intends to award construction subcontracts for any portion of the Wicks trade work at the time of bid submission, regardless of what point in the life of the contract such subcontracts will occur. In identifying intended subcontractors in the bid submission, bidders may satisfy any Participation Goals established for this Contract by proposing one or more subcontractors that are MBEs and/or WBEs for any portion of the Wicks trade work. In the event that the Contractor's selection of a subcontractor is disapproved, the Contractor shall have a reasonable time to propose alternate subcontractors.

6. MBE and WBE firms must be certified by DSBS in order for the Contractor to credit such firms' participation toward the attainment of the Participation Goals. Such certification must occur prior to the firms' commencement of work. A list of city-certified MBE and WBE firms may be obtained from the DSBS website at www.nyc.gov/buycertified, by emailing DSBS at buyer@sbs.nyc.gov, by calling (212) 513-6451, or by visiting or writing DSBS at One Liberty Plaza ., New York, New York, 10006, 11th floor. Eligible firms that have not yet

been certified may contact DSBS in order to seek certification by visiting www.nyc.gov/getcertified, emailing MWBE@sbs.nyc.gov, or calling the DSBS certification helpline at (212) 513-6311. A firm that is certified as both an MBE and a WBE may be counted either toward the goal for MBEs or the goal for WBEs, but not both. No credit shall be given for participation by a graduate MBE or graduate WBE, as defined in Section 6-129(c)(20).

7. Where an M/WBE Utilization Plan has been submitted, the Contractor shall, with each voucher for payment, and/or periodically as Agency may require, submit statements, certified under penalty of perjury, which shall include, but not be limited to,: the total amount the Contractor paid to its direct subcontractors, and, where applicable pursuant to Section 6-129(j), the total amount direct subcontractors paid to indirect subcontractors; the names, addresses and contact numbers of each MBE or WBE hired as a subcontractor by the Contractor, and, where applicable, hired by any of the Contractor's direct subcontractors; and the dates and amounts paid to each MBE or WBE. The Contractor shall also submit, along with its voucher for final payment: the total amount it paid to subcontractors, and, where applicable pursuant to Section 6- 129(j), the total amount its direct subcontractors paid directly to their indirect subcontractors; and a final list, certified under penalty of perjury, which shall include the name, address and contact information of each subcontractor that is an MBE or WBE, the work performed by, and the dates and amounts paid to each.

8. If payments made to, or work performed by, MBEs or WBEs are less than the amount specified in the Contractor's M/WBE Utilization Plan, Agency shall take appropriate action, in accordance with Section 6-129 and Article II below, unless the Contractor has obtained a modification of its M/WBE Utilization Plan in accordance with Section 6-129 and Part A, Section 11 below.

9. Where an M/WBE Utilization Plan has been submitted, and the Contractor requests a change order the value of which exceeds the greater of 10 percent of the Contract or Task Order, as applicable, or $500,000, Agency shall review the scope of work for the Contract or Task Order, as applicable, and the scale and types of work involved in the change order, and determine whether the Participation Goals should be modified.

10. Pre-award waiver of the Participation Goals. (a) A bidder or proposer, or contractor with respect to a Task Order, may seek a pre-award full or partial waiver of the Participation Goals in accordance with Section 6-129, which requests that Agency change one or more Participation Goals on the grounds that the Participation Goals are unreasonable in light of the availability of certified firms to perform the services required, or by demonstrating that it has legitimate business reasons for proposing a lower level of subcontracting in its M/WBE Utilization Plan.

(b) To apply for a full or partial waiver of the Participation Goals, a bidder, proposer, or contractor, as applicable, must complete Part 3 of Schedule B **and submit such request no later than seven (7) calendar days prior to the date and time the bids, proposals, or Task Orders are due, in writing by email at MWBEModification@ddc.nyc.gov. Full or partial waiver requests that are received later than seven (7) calendar days prior to the date and time the bids, proposals, or Task Orders are due may be rejected as untimely.** Bidders, proposers, or contractors, as applicable, who have submitted timely requests will receive an Agency response by no later than two (2) calendar days prior to the due date for bids, proposals, or Task Orders; provided, however, that if that date would fall on a weekend or holiday, an Agency response will be provided by close-of-business on the business day before such weekend or holiday date.

(c) If the Agency determines that the Participation Goals are unreasonable in light of the availability of certified firms to perform the services required, it shall revise the solicitation and extend the deadline for bids and proposals, or revise the Task Order, as applicable.

(d) Agency may grant a full or partial waiver of the Participation Goals to a bidder, proposer or contractor, as applicable, who demonstrates—before submission of the bid, proposal or Task Order, as applicable—that it has legitimate business reasons for proposing the level of subcontracting in its M/WBE Utilization Plan. In making its determination, Agency shall consider factors that shall include, but not be limited

to, whether the bidder, proposer or contractor, as applicable, has the capacity and the bona fide intention to perform the Contract without any subcontracting, or to perform the Contract without awarding the amount of subcontracts represented by the Participation Goals. In making such determination, Agency may consider whether the M/WBE Utilization Plan is consistent with past subcontracting practices of the bidder, proposer or contractor, as applicable, whether the bidder, proposer or contractor, as applicable, has made efforts to form a joint venture with a certified firm, and whether the bidder, proposer, or contractor, as applicable, has made good faith efforts to identify other portions of the Contract that it intends to subcontract.

11. Modification of M/WBE Utilization Plan. (a) A Contractor may request a modification of its M/WBE Utilization Plan after award of this Contract. PLEASE NOTE: If this Contract is a public works project subject to GML §101(5) (i.e., a contract valued at or below $3M for projects in New York City) or if the Contract is subject to a project labor agreement in accordance with Labor Law §222, and the bidder is required to identify at the time of bid submission its intended subcontractors for the Wicks trades (plumbing and gas fitting; steam heating, hot water heating, ventilating and air conditioning (HVAC); and electric wiring), the Contractor may request a Modification of its M/WBE Utilization Plan as part of its bid submission. The Agency may grant a request for Modification of a Contractor's M/WBE Utilization Plan if it determines that the Contractor has established, with appropriate documentary and other evidence, that it made reasonable, good faith efforts to meet the Participation Goals. In making such determination, Agency shall consider evidence of the following efforts, as applicable, along with any other relevant factors:

(i) The Contractor advertised opportunities to participate in the Contract, where appropriate, in general circulation media, trade and professional association publications and small business media, and publications of minority and women's business organizations;
(ii) The Contractor provided notice of specific opportunities to participate in the Contract, in a timely manner, to minority and women's business organizations;
(iii) The Contractor sent written notices, by certified mail or facsimile, in a timely manner, to advise MBEs or WBEs that their interest in the Contract was solicited;
(iv) The Contractor made efforts to identify portions of the work that could be substituted for portions originally designated for participation by MBEs and/or WBEs in the M/WBE Utilization Plan, and for which the Contractor claims an inability to retain MBEs or WBEs;
(v) The Contractor held meetings with MBEs and/or WBEs prior to the date their bids or proposals were due, for the purpose of explaining in detail the scope and requirements of the work for which their bids or proposals were solicited;
(vi) The Contractor made efforts to negotiate with MBEs and/or WBEs as relevant to perform specific subcontracts, or act as suppliers or service providers;
(vii) Timely written requests for assistance made by the Contractor to Agency's M/WBE liaison officer and to DSBS;
(viii) Description of how recommendations made by DSBS and Agency were acted upon and an explanation of why action upon such recommendations did not lead to the desired level of participation of MBEs and/or WBEs.

Agency's M/WBE officer shall provide written notice to the Contractor of the determination.

(b) The Agency may modify the Participation Goals when the scope of the work has been changed by the Agency in a manner that affects the scale and types of work that the Contractor indicated in its M/WBE Utilization Plan would be awarded to subcontractors.

12. If the Contractor was required to identify in its bid or proposal the MBEs and/or WBEs they intended to use in connection with the performance of the Contract or Task Order, substitutions to the identified firms may only be made with the approval of the Agency, which shall only be given when the Contractor has proposed to use a firm that would satisfy the Participation Goals to the same extent as the firm previously identified, unless the Agency determines that the Contractor has established, with appropriate documentary and other evidence, that it made reasonable, good faith efforts. In making such determination, the Agency shall require evidence of the

efforts listed in Section 11(a) above, as applicable, along with any other relevant factors.

13. If this Contract is for an indefinite quantity of construction, standard or professional services or is a requirements type contract and the Contractor has submitted an M/WBE Utilization Plan and has committed to subcontract work to MBEs and/or WBEs in order to meet the Participation Goals, the Contractor will not be deemed in violation of the M/WBE Program requirements for this Contract with regard to any work which was intended to be subcontracted to an MBE and/or WBE to the extent that the Agency has determined that such work is not needed.

14. If Participation Goals have been established for this Contract or a Task Order issued pursuant to this Contract, at least once annually during the term of the Contract or Task Order, as applicable, Agency shall review the Contractor's progress toward attainment of its M/WBE Utilization Plan, including but not limited to, by reviewing the percentage of work the Contractor has actually awarded to MBE and/or WBE subcontractors and the payments the Contractor made to such subcontractors.

15. If Participation Goals have been established for this Contract or a Task Order issued pursuant to this Contract, Agency shall evaluate and assess the Contractor's performance in meeting those goals, and such evaluation and assessment shall become part of the Contractor's overall contract performance evaluation.

PART B: MISCELLANEOUS

The Contractor shall take notice that, if this solicitation requires the establishment of a M/WBE Utilization Plan, the resulting contract may be audited by DSBS to determine compliance with Section 6-129. See §6-129(e)(10). Furthermore, such resulting contract may also be examined by the City's Comptroller to assess compliance with the M/WBE Utilization Plan.

1. Pursuant to DSBS rules, construction contracts that include a requirement for a M/WBE Utilization Plan shall not be subject to the law governing Locally Based Enterprises set forth in Section 6-108.1 of the Administrative Code of the City of New York.

2. DSBS is available to assist contractors and potential contractors in determining the availability of MBEs and/or WBEs to participate as subcontractors, and in identifying opportunities that are appropriate for participation by MBEs and/or WBEs in contracts.

3. Prospective contractors are encouraged to enter into qualified joint venture agreements with MBEs and/or WBEs as defined by Section 6-129(c)(30).

4. By submitting a bid or proposal the Contractor hereby acknowledges its understanding of the M/WBE Program requirements set forth herein and the pertinent provisions of Section 6-129, and any rules promulgated thereunder, and if awarded this Contract, the Contractor hereby agrees to comply with the M/WBE Program requirements of this Contract and pertinent provisions of Section 6-129, and any rules promulgated thereunder, all of which shall be deemed to be material terms of this Contract. The Contractor hereby agrees to make all reasonable, good faith efforts to solicit and obtain the participation of MBEs and/or WBEs to meet the required Participation Goals.

ARTICLE II. ENFORCEMENT

1. If Agency determines that a bidder or proposer, as applicable, has, in relation to this procurement, violated Section 6-129 or the DSBS rules promulgated pursuant to Section 6-129, Agency may disqualify such bidder or proposer, as applicable, from competing for this Contract and the Agency may revoke such bidder's or proposer's prequalification status, if applicable.

2. Whenever Agency believes that the Contractor or a subcontractor is not in compliance with Section 6-129

or the DSBS rules promulgated pursuant to Section 6-129, or any provision of this Contract that implements Section 6-129, including, but not limited to any M/WBE Utilization Plan, Agency shall send a written notice to the Contractor describing the alleged noncompliance and offering the Contractor an opportunity to be heard. Agency shall then conduct an investigation to determine whether such Contractor or subcontractor is in compliance.

3. In the event that the Contractor has been found to have violated Section 6-129, the DSBS rules promulgated pursuant to Section 6-129, or any provision of this Contract that implements Section 6-129, including, but not limited to, any M/WBE Utilization Plan, Agency may determine that one of the following actions should be taken:

(a) entering into an agreement with the Contractor allowing the Contractor to cure the violation;
(b) revoking the Contractor's pre-qualification to bid or make proposals for future contracts;
(c) making a finding that the Contractor is in default of the Contract;
(d) terminating the Contract;
(e) declaring the Contractor to be in breach of Contract;
(f) withholding payment or reimbursement;
(g) determining not to renew the Contract;
(h) assessing actual and consequential damages;
(i) assessing liquidated damages or reducing fees, provided that liquidated damages may be based on amounts representing costs of delays in carrying out the purposes of the M/WBE Program, or in meeting the purposes of the Contract, the costs of meeting utilization goals through additional procurements, the administrative costs of investigation and enforcement, or other factors set forth in the Contract;
(j) exercising rights under the Contract to procure goods, services or construction from another contractor and charge the cost of such contract to the Contractor that has been found to be in noncompliance; or
(k) taking any other appropriate remedy.

4. If an M/WBE Utilization Plan has been submitted, and pursuant to this Article II, Section 3, the Contractor has been found to have failed to fulfill its Participation Goals contained in its M/WBE Utilization Plan or the Participation Goals as modified by Agency pursuant to Article I, Part A, Section 11, Agency may assess liquidated damages in the amount of ten percent (10%) of the difference between the dollar amount of work required to be awarded to MBE and/or WBE firms to meet the Participation Goals and the dollar amount the Contractor actually awarded and paid, and/or credited, to MBE and/or WBE firms. In view of the difficulty of accurately ascertaining the loss which the City will suffer by reason of Contractor’s failure to meet the Participation Goals, the foregoing amount is hereby fixed and agreed as the liquidated damages that the City will suffer by reason of such failure, and not as a penalty. Agency may deduct and retain out of any monies which may become due under this Contract the amount of any such liquidated damages; and in case the amount which may become due under this Contract shall be less than the amount of liquidated damages suffered by the City, the Contractor shall be liable to pay the difference.

5. Whenever Agency has reason to believe that an MBE and/or WBE is not qualified for certification, or is participating in a contract in a manner that does not serve a commercially useful function (as defined in Section 6-129(c)(8)), or has violated any provision of Section 6- 129, Agency shall notify the Commissioner of DSBS who shall determine whether the certification of such business enterprise should be revoked.

6. Statements made in any instrument submitted to Agency pursuant to Section 6-129 shall be submitted under penalty of perjury and any false or misleading statement or omission shall be grounds for the application of any applicable criminal and/or civil penalties for perjury. The making of a false or fraudulent statement by an MBE and/or WBE in any instrument submitted pursuant to Section 6-129 shall, in addition, be grounds for revocation of its certification.

7. The Contractor's record in implementing its M/WBE Utilization Plan shall be a factor in the evaluation of

its performance. Whenever Agency determines that a Contractor's compliance with an M/WBE Utilization Plan has been unsatisfactory, Agency shall, after consultation with the City Chief Procurement Officer, file an advice of caution form for inclusion in PASSPort as caution data.

Docusign Envelope ID: F8230482-FB0C-4286-A244-080BC6D43969

CONTRACT SIGNATURE PAGE

This Contract is entered by and between the City of New York ("City"), acting by and through the **DEPARTMENT OF DESIGN AND CONSTRUCTION**, and **JOBCO INCORPORATED** ("Contractor").

This Contract consists of this contract signature page as well as the following documents ("Contract Documents") which are located in the Documents tab of the PASSPort record titled **85025B0031-LQASADA** .

1. CBB Signed(2) - May 5 2025 1:41PM
2. Certificate of Liability Insurance Automobile - May 5 2025 1:57PM
3. DDCNY disability COI - May 5 2025 1:43PM
4. DDCNY Liability COI - May 5 2025 1:41PM
5. LQASADA Bid Breakdown Details - May 5 2025 7:19PM
6. LQASADA Special Experience Requirements - May 5 2025 7:12PM
7. LQASADA_Addendum1 - Feb 24 2025 2:08PM
8. LQASADA_Addendum2 - Mar 7 2025 6:33PM
9. LQASADA_Appendix_Addendum2 - Mar 3 2025 3:01PM
10. LQASADA_Bid Drawings_Addendum2 - Feb 27 2025 3:34PM
11. LQASADA_Proprietary Items - Dec 12 2024 1:00PM
12. LQASADA_Special Experience Requirements - Apr 25 2025 7:27PM
13. LQASADA_Volume2_Addendum2 - Mar 3 2025 2:57PM
14. LQASADA_Volume3_Addendum2(1) - Mar 3 2025 3:00PM
15. NYS CERT OF CONTRACTOR REG PFCI 2024 - 2026(1) - May 2 2025 6:46PM
16. Payment Bond Astoria Library - May 5 2025 1:34PM
17. Performancebond - May 5 2025 1:43PM
18. Proposal_Bid_85025B0031001.pdf - Apr 24 2025 4:44PM
19. RFx Document_85025B0031001 (1).pdf - Apr 24 2025 4:44PM
20. Signed Bid Bond - May 5 2025 6:40PM
21. Subcontractor ID Form - Oct 30 2024 8:55PM
22. subcontractorslist_20250320120357 - Mar 20 2025 5:05PM
23. Volume 1 PB Bid Booklet (Single PLA) - 2024-07-01 - Nov 23 2024 1:22AM
24. WC COI - NYC DDC(1) - May 5 2025 1:43PM

The above order does not represent an order of precedence. The Contract shall be governed by the

Docusign Envelope ID: F8230482-FB0C-4286-A244-080BC6D43969

order of precedence, if any, in the Contract Documents or by ordinary contract principles if no such order of precedence exists.

Each party is signing this Contract electronically on the date stated in that party's electronic signature.

The City of New York
By: **DEPARTMENT OF DESIGN AND CONSTRUCTION**

DocuSigned by:
ERIC MACFARLANE
1A87ABA0188B41C...
(Signature)

Name: ERIC MACFARLANE

Title: First Deputy Commissioner

Date: 5/9/2025 | 07:34:50 PDT

Contractor
By: **JOBCO INCORPORATED**

Signed by:
Spiros Triantafyllou
8F177ACCEAE4451...
(Signature)

Name: Spiros Triantafyllou

Title: Secretary

Date: 5/9/2025 | 05:42:39 PDT

Docusign Envelope ID: F8230482-FB0C-4286-A244-080BC6D43969

Signatures

Number of pages (including this one): 3

- ✓ Document signed electronically, the signatories agreeing that it is authentic between them.
- ✓ By signing this document, the signatories acknowledge and agree that they have carefully read this document and approve all its terms.

Nom: Triantafyllou Spiros Fonction: Secretary	Place: ST Date: 5/9/2025 | 05:42:39 PDT Signed by: Spiros Triantafyllou 8F177ACCEAE4451...

Nom: Macfarlane Eric Fonction:	Place: lic ny Date: 5/9/2025 | 07:34:50 PDT DocuSigned by: ERIC MACFARLANE 1A87ABA0188B41C...

Client#: 2065570 JOBCOINC1

ACORD™ CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 4/22/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer any rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
USI Insurance Services LLC
333 Westchester Ave, Suite 102
White Plains, NY 10604
914 459-6200

CONTACT NAME: D J Hardisty
PHONE (A/C, No, Ext): 914 459-6200 FAX (A/C, No): 610 537-4220
E-MAIL ADDRESS: DJ.Hardisty@usi.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Continental Indemnity Company	28258
INSURER B :	
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED
Jobco Incorporated
1983 Marcus Ave Ste 137
New Hyde Park, NY 11042-2013

COVERAGES CERTIFICATE NUMBER: REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY	X	X	JCI24PNAG0366401	11/01/2024	11/01/2025	EACH OCCURRENCE	$2,000,000
	CLAIMS-MADE X OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$50,000
							MED EXP (Any one person)	$Excl
							PERSONAL & ADV INJURY	$1,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$4,000,000
	POLICY X PRO-JECT LOC						PRODUCTS - COMP/OP AGG	$4,000,000
	OTHER:							$
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$
	ANY AUTO						BODILY INJURY (Per person)	$
	OWNED AUTOS ONLY / SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	HIRED AUTOS ONLY / NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
								$
A	UMBRELLA LIAB X OCCUR			JCI24XNAG0366501	11/01/2024	11/01/2025	EACH OCCURRENCE	$3,000,000
	X EXCESS LIAB CLAIMS-MADE						AGGREGATE	$3,000,000
	DED RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						PER STATUTE / OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED?	N / A					E.L. EACH ACCIDENT	$
	(Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

RE: # LQASADA - Astoria Branch Library Renovation (Medium GC PQL)

The General Liability and Excess Liability policies include an automatic Additional Insured endorsement that provides Additional Insured status to City of New York, including its officials and employees, The Queens Borough Public Library and the Library Board of Trustees only when there is a written contract that requires such status, and only with regard to work performed by or on behalf of the named insured.

CERTIFICATE HOLDER

New York City Department of Design and Construction,
30-30 Thomson Ave.,
Long Island City, NY 11101

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Uuu Scott

© 1988-2015 ACORD CORPORATION. All rights reserved.

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 4/28/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Total Dollar Insurance - New York
1 Pleasant Avenue
Port Washington NY 11050

License#: 648017

CONTACT NAME: James Milleew
PHONE (A/C, No, Ext): 516-833-1542 **FAX (A/C, No):** 516-704-2251
E-MAIL ADDRESS: jmilleew@totaldollar.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Utica Mutual Insurance Company	25976
INSURER B :	
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED
JOBCINC-01
JOBCO Incorporated
3333 New Hyde Park Rd
Suite 200
New Hyde Park NY 11042

COVERAGES **CERTIFICATE NUMBER:** 2051220878 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	COMMERCIAL GENERAL LIABILITY						EACH OCCURRENCE	$
	CLAIMS-MADE / OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$
							MED EXP (Any one person)	$
							PERSONAL & ADV INJURY	$
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$
	POLICY / PRO-JECT / LOC						PRODUCTS - COMP/OP AGG	$
	OTHER:							$
A	**AUTOMOBILE LIABILITY**	Y	Y	5629855	3/5/2025	3/5/2026	COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
	X ANY AUTO						BODILY INJURY (Per person)	$
	OWNED AUTOS ONLY / X SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	X HIRED AUTOS ONLY / X NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
	X COMPREHENSIV / X COLLISION						Deductible	$ 2,000
	UMBRELLA LIAB / OCCUR						EACH OCCURRENCE	$
	EXCESS LIAB / CLAIMS-MADE						AGGREGATE	$
	DED / RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N	N / A					PER STATUTE / OTH-ER	
	ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? **(Mandatory in NH)** If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. EACH ACCIDENT	$
							E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

RE: # LQASADA - Astoria Branch Library Renovation (Medium GC PQL)

City of New York is included as an Additional Insured with a Waiver of Subrogation in their favor per written contract subject to all terms, conditions and exclusions of the actual Insurance Policy. The policies are primary and non-contributory.

CERTIFICATE HOLDER

New York City Department of Design and Construction
30-30 Thomson Ave
Long Island City NY 11101

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

© 1988-2015 ACORD CORPORATION. All rights reserved.

CITY OF NEW YORK

CERTIFICATION BY INSURANCE BROKER OR AGENT

The undersigned insurance broker or agent represents to the City of New York that the attached Certificate of Insurance is accurate in all material respects.

USI Insurance Services LLC
[Name of broker or agent (typewritten)]

333 Westchester Avenue, Suite 102
White Plains, NY 10604
[Address of broker or agent (typewritten)]

VictoriaL.Murphy@usi.com
[Email address of Authorized Broker or agent(typewritten)]

(914) 459-6200/ (610) 537-4220
[Phone Number/Fax Number of broker (typewritten)]

[Signature of Authorized Official or Broker]

Victoria Murphy, Account Manager
[Name and title of authorized official (typewritten)]

State of New York

County of Westchester

Sworn to before me this 3rd day of April 2025

NOTARY PUBLIC For The State Of New York

MAUREEN A KITTRICK
NOTARY PUBLIC STATE OF NEW YORK
LIC. #01KI4986881
COMMISSION EXPIRES 09/30/2025

Workers' Compensation Board

CERTIFICATE OF INSURANCE COVERAGE
under the NYS DISABILITY AND PAID FAMILY LEAVE BENEFITS LAW

PART 1. To be completed by Disability and Paid Family Leave Benefits Carrier or Licensed Insurance Agent of that Carrier

1a. Legal Name & Address of Insured (use street address only)

JOBCO INCORPORATED
3333 NEW HYDE PARK RD, SUITE 200

NEW HYDE PARK NY 11042

Work Location of Insured
(Only required if coverage is specifically limited to certain locations in New York State, i.e., Wrap-Up Policy)

1b. Business Telephone Number of Insured

516-487-0050

1c. Federal Employer Identification Number of Insured or Social Security Number

111734293

2. Name and Address of Entity Requesting Proof of Coverage (Entity Being Listed as the Certificate Holder)

NEW YORK CITY DEPARTMENT OF DESIGN AND CONSTRUCTION
30-30 THOMSON AVENUE
LONG ISLAND CITY, NY 10011

3a Name of Insurance Carrier
HARTFORD LIFE AND ACCIDENT INSURANCE COMPANY

3b Policy Number of Entity Listed in Box "1a"

LNY-330952

3c Policy effective period
01/01/2025 to 12/31/2025

4. Policy provides the following benefits:

- [0] A. Both disability and paid family leave benefits.
- [ ] B. Disability benefits only.
- [ ] C. Paid family leave benefits only.

5. Policy covers:

- [0] A. All of the employer's employees eligible under the NYS Disability and Paid Family Leave Benefits Law
- [ ] B. Only the following class or classes of employer's employees:

Under penalty of perjury, I certify that I am an authorized representative or licensed agent of the insurance carrier referenced above and that the named insured has NYS Disability and/or Paid Family Leave Benefits insurance coverage as described above.

Date Signed 12/19/2024 *Elizabeth Tello*

(Signature of insurance carrier's authorized representative or NYS Licensed Insurance Agent of that insurance carrier)

Telephone Number (212) 553-8074 **Name and Title:** Elizabeth Tello – Assistant Director, Statutory Services

IMPORTANT: If Boxes 4A and 5A are checked, and this form is signed by the insurance carrier's authorized representative or NYS Licensed Insurance Agent of that carrier, this certificate is COMPLETE. Mail it directly to the certificate holder.

If Box 4B, 4C or 5B is checked, this certificate is NOT COMPLETE for purposes of Section 220, Subd. 8 of the NYS Disability and Paid Family Leave Benefits Law. It must be mailed for completion to the Workers' Compensation Board, Plans Acceptance Unit, PO Box 5200, Binghamton, NY 13902-5200.

PART 2. To be completed by the NYS Workers' Compensation Board (Only if Box 4C or 5B of Part 1 has been checked)

State of New York
Workers' Compensation Board

According to information maintained by the NYS Workers' Compensation Board, the above-named employer has complied with the NYS Disability and Paid Family Leave Benefits Law with respect to all of his/her employees.

Date Signed **By**

(Signature of Authorized NYS Workers' Compensation Board Employee)

Telephone Number **Name and Title**

Please Note: Only insurance carriers licensed to write NYS disability and paid family leave benefits insurance policies and NYS licensed insurance agents of those insurance carriers are authorized to issue Form DB-120.1. Insurance brokers are NOT authorized to issue this form.

NYSIF
New York State Insurance Fund

PO Box 66699, Albany, NY 12206
| nysif.com

CERTIFICATE OF WORKERS' COMPENSATION INSURANCE (RENEWED)

^ ^ ^ ^ ^ ^ 111734293
THE FLANDERS GROUP
300 LINDEN OAKS
SUITE 210 - 1ST FLOOR
ROCHESTER NY 14625

SCAN TO VALIDATE
AND SUBSCRIBE

POLICYHOLDER	CERTIFICATE HOLDER
JOBCO INCORPORATED 1983 MARCUS AVENUE - SUITE 137 NEW HYDE PARK NY 110422013	NYC DEPARTMENT OF DESIGN AND CONSTRUCTION 30-30 THOMSON AVENUE LONG ISLAND CITY NY 10011

POLICY NUMBER	CERTIFICATE NUMBER	POLICY PERIOD	DATE
Z2239 873-9	575006	01/01/2025 TO 01/01/2026	12/19/2024

THIS IS TO CERTIFY THAT THE POLICYHOLDER NAMED ABOVE IS INSURED WITH THE NEW YORK STATE INSURANCE FUND UNDER POLICY NO. 2239 873-9, COVERING THE ENTIRE OBLIGATION OF THIS POLICYHOLDER FOR WORKERS' COMPENSATION UNDER THE NEW YORK WORKERS' COMPENSATION LAW WITH RESPECT TO ALL OPERATIONS IN THE STATE OF NEW YORK, EXCEPT AS INDICATED BELOW.

IF YOU WISH TO RECEIVE NOTIFICATIONS REGARDING SAID POLICY, INCLUDING ANY NOTIFICATION OF CANCELLATIONS, OR TO VALIDATE THIS CERTIFICATE, VISIT OUR WEBSITE AT HTTPS://WWW.NYSIF.COM/CERT/CERTVAL.ASP. THE NEW YORK STATE INSURANCE FUND IS NOT LIABLE IN THE EVENT OF FAILURE TO GIVE SUCH NOTIFICATIONS.

THE POLICY INCLUDES A WAIVER OF SUBROGATION ENDORSEMENT UNDER WHICH NYSIF AGREES TO WAIVE ITS RIGHT OF SUBROGATION TO BRING AN ACTION AGAINST THE CERTIFICATE HOLDER TO RECOVER AMOUNTS WE PAID IN WORKERS' COMPENSATION AND/OR MEDICAL BENEFITS TO OR ON BEHALF OF AN EMPLOYEE OF OUR INSURED IN THE EVENT THAT, PRIOR TO THE DATE OF THE ACCIDENT, THE CERTIFICATE HOLDER HAS ENTERED INTO A WRITTEN CONTRACT WITH OUR INSURED THAT REQUIRES THAT SUCH RIGHT OF SUBROGATION BE WAIVED.

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS NOR INSURANCE COVERAGE UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICY.

NEW YORK STATE INSURANCE FUND

DIRECTOR,INSURANCE FUND UNDERWRITING

VALIDATION NUMBER: 222265212

PERFORMANCE BOND #1

Performance Bond #1 (4 Pages): Use if the total contract price is $5 Million Or Less. Performance Bond #1 has been approved by the U.S. Small Business Administration ("SBA")for participation in its Bond Guarantee Program.

PERFORMANCE BOND #1 (Page 1)

KNOW ALL PERSONS BY THESE PRESENTS:,

That we, _____

_____

_____

hereinafter referred to as the "Principal,"

and, _____

_____

_____

hereinafter referred to as the "Surety" ("Sureties") are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "City" or to its successors and assigns in the penal sum of _____

_____

_____

($_____) Dollars, lawful money of the United States for the payment of whichsaid sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal is about to enter, or has entered, into a Contract in writing with the City for

_____

_____

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth infull;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns, shall well and faithfully perform the said Contract and all modifications, amendments, additions and alterations thereto that may hereafter be made, according to its terms and its true intent and meaning, including repair and or replacement of defective work and guarantees of maintenance for the periods stated in the Contract, and shall fully indemnify and save harmless the City from all cost and damage which it may suffer by reason of the Principal's default of the Contract, and shall fully reimburse and repay the City for all outlay and expense which the City may incur in making good any such default and shall protect the said City of New York against, and pay any and all amounts, damages, cost and judgments which may or shall be recovered against said City or its officers or agents or which the said City of New York may be called upon to pay any person or corporation by reason of any damages arising or growing out of the Principal's default of the Contract, then this obligation shall be nulland void, otherwise to remain in full force and effect.

The Surety (Sureties), for value received, hereby stipulates and agrees, upon written notice from the Citythat the City has determined that the Principal is in default of the Contract, to (1) pay the City the cost tocomplete the contract as determined by the City in excess of the balance of the Contract held by the City, plus any damages or costs to which the City is entitled, up to the full amount of the above penal sum, (2)fully perform and complete the Work to be performed under the Contract, pursuant to the terms, conditions, and covenants thereof, or (3) tender a completion Contractor that is acceptable to the City. The Surety (Sureties) further agrees, at its option, either to notify the City that it elects to pay the city thecost of completion plus any applicable damages and costs under option (1) above, or to commence anddiligently perform the Work specified in the Contract, including physical site work, within twenty-five
(25) business days after written notice thereof from the City and, if the Surety elects to fully perform and complete the Work, then to complete all Work within the time set forth in the Contract or such other timeas agreed to between the City and Surety in accordance with the Contract. If the Surety elects to tender payment pursuant to (1) above, then the Surety shall tender such amount within fifteen (15) business days notification from the City of the cost of completion. The Surety and the City reserve all rights and defenses each may have against the other; provided, however, that the Surety expressly agrees that its reservation of rights shall not provide a basis for non-performance of its obligation to pay the City the costof completion, to commence and complete all Work as provided herein, or to tender a completion contractor.

The Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties) and its bond shall be in no way impaired or affected byany extension of time, modification, omission, addition, or change in or to the said Contract or the Workto be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or any moneys due or to become due thereunder; and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions,changes, payments, and waivers, and hereby expressly stipulates and agrees that any and all things doneand omitted to be done by and in relation to subcontractors shall have the same effect as to said Surety (Sureties) as though done or omitted to be done by or in relation to said Principal. Notwithstanding the above, if the City makes payments to the Principal before the time required by the contract that in the aggregate exceed $100,000 or 10% of the Contract price, whichever is less, and that have not become earned prior to the Principal being found to be in default, then all payments made to the Principal before the time required by the Contract shall be added to the remaining contract value available to be paid forthe completion of the Contract as if such sums had not been paid to the Principal, but shall not provide abasis for non-performance of its obligation to pay the City the cost of completion, to commence and to complete all Work as provided herein, or to tender a completion contractor.

IN WITNESS WHEREOF, The Principal and the Surety (Sureties) have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereunto affixed and these presents to be signed by their proper officers, this

_____ day of_____, 20_____.(Seal)

_____(L.S.)
Principal

(Seal)

By: _____.

Surety

By:_____.
_____.
(Seal) Surety

By:_____.
_____.
(Seal) Surety

By:_____.
_____.
(Seal) Surety

By:_____.
_____.
(Seal) Surety

By:_____.

Bond Premium Rate _____.

Bond Premium Cost _____.

If the Contractor (Principal) is a partnership, the bond should be signed by each of the individuals who are partners.

If the Contractor (Principal) is a corporation, the bond should be signed in its correct corporate name by aduly authorized officer, agent, or attorney-in-fact.

There should be executed an appropriate number of counterparts of the bond corresponding to the numberof counterparts of the Contract.

ACKNOWLEDGMENT OF PRINCIPAL IF A CORPORATION

State of_____County of_____ss:

On this_____day of_____, 20_____before me personally came_____,
to me known, who, being by me duly sworn did depose and say that he/she residesat _____
_____; that he/she is the _____
of the corporation described in and which executed the foregoing instrument; and that he/she signed his/her name to the foregoing instrument by order of the directors of said corporation as the duly authorized and binding act thereof.

_____
Notary Public or Commissioner of Deeds.

ACKNOWLEDGMENT OF PRINCIPAL IF A PARTNERSHIP

State of_____County of_____ss:

On this_____day of_____, 20_____before me personally came_____,
to me known, who, being by me duly sworn did dispose and say that he/she residesat _____
_____; that he/she is_____partner of
_____, a limited/general partnership existing under the laws of the State of
_____, the partnership described in and which executed the foregoing instrument; and that he/she signed his/her name to the foregoing instrument as the duly authorized and binding act ofsaid partnership.

_____
Notary Public or Commissioner of Deeds.

ACKNOWLEDGMENT OF PRINCIPAL IF AN INDIVIDUAL

State of_____County of_____ss:

On this_____day of_____, 20_____before me personally came_____,
to me known, who, being by me duly sworn did depose and say that he/she residesat _____
_____, and that he/she is the individual whose name is subscribed to the within instrument and acknowledged to me that by his/her signature on the instrument, said individual executed the instrument.

_____
Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties; (b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bond is executed by agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

* * * * * * * *

Affix Acknowledgments and Justification of Sureties.

PERFORMANCE BOND #2

Performance Bond #2 (4 pages): Use if the total contract price is more than $5 Million.

PERFORMANCE BOND #2 (Page 1)

PERFORMANCE BOND #2KNOW ALL PERSONS BY THESE PRESENTS:,

That we, Jobco Incorporated

3333 New Hyde Park Rd, Suite 200

New Hyde Park, NY 11042

hereinafter referred to as the "Principal,"
and, Developers Surety and Indemnity Company

P.O. BOX 19725

Irvine, CA 92623-9725

hereinafter referred to as the "Surety" ("Sureties") are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "City" or to its successors and assigns in the penal sum of Twelve Million Seven Hundred Forty-Three Thousand Three Hundred Thirty-Three

and 00/100 Dollars

($ 12,743,333.00) Dollars, lawful money of the United States for the payment of which said sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal is about to enter, or has entered, into a Contract in writing with the City for

Project ID: LQASADA - Astoria Branch Library Renovation

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth infull;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns, shall well and faithfully perform the said Contract and all modifications, amendments, additions and alterations thereto that may hereafter be made, according to its terms and its true intent and meaning, including repair and or replacement of defective work and guarantees of maintenance for the periods stated in the Contract, and shall fully indemnify and save harmless the Cityfrom all cost and damage which it may suffer by reason of the Principal's default of the Contract, and shall fully reimburse and repay the City for all outlay and expense which the City may incur in making

good any such default and shall protect the said City of New York against, and pay any and all amounts,damages, cost and judgments which may or shall be recovered against said City or its officers or agents orwhich the said City of New York may be called upon to pay any person or corporation by reason of anydamages arising or growing out of the Principal's default of the Contract, then this obligation shall be nulland void, otherwise to remain in full force and effect.

The Surety (Sureties), for value received, hereby stipulates and agrees, upon written notice from the Citythat the City has determined that the Principal is in default of the Contract, to either (1) pay the full amount of the above penal sum in complete discharge and exoneration of this bond and of all the liabilities of the Surety relating to this bond, or (2) fully perform and complete the Work to be performed under theContract, pursuant to the terms, conditions, and covenants thereof. The Surety (Sureties) further agrees, at its option, either to tender the penal sum or to commence and diligently perform the Work specified in the Contract, including physical site work, within twenty-five (25) business days after written notice thereoffrom the City and to complete all Work within the time set forth in the Contract or such other time as agreed to between the City and Surety in accordance with the Contract. The Surety and the City reserveall rights and defenses each may have against the other; provided, however, that the Surety expressly agrees that its reservation of rights shall not provide a basis for non-performance of its obligation to commence and to complete all Work as provided herein.

The Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties) and its bond shall be in no way impaired or affected byany extension of time, modification, omission, addition, or change in or to the said Contract or the Workto be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any Work to be performed or any moneys due or to become due thereunder; and said Surety (Sureties) does herebywaive notice of any and all of such extensions, modifications, omissions, additions, changes, payments,waivers, assignments, subcontracts and transfers, and hereby expressly stipulates and agrees that any andall things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to said Surety (Sureties) as though done or omitted to be done by or in relation to said Principal.

IN WITNESS WHEREOF, The Principal and the Surety (Sureties) have hereunto set their hands and seals,and such of them as are corporations have caused their corporate seals to be hereunto affixed and these presents to be signed by their proper officers, this

1st day of May 20 25.

(Seal)

Jobco Incorporated (L.S.)

Principal

(Seal)

By: Ron Pasini, Pres.

Surety

Developers Surety and Indemnity Company

By: Andrea E. Gorbert

Andrea E. Gorbert, Attorney-in-Fact

(Seal)

Surety

By:

(Seal)

Surety

By:

(Seal)

Surety

By:

(Seal)

Surety

By:

Bond Premium Rate 25/15/10/7/6.50 slide.

Bond Premium Cost $110,692.00.

If the Contractor (Principal) is a partnership, the bond should be signed by each of the individuals who are partners.

If the Contractor (Principal) is a corporation, the bond should be signed in its correct corporate name by aduly authorized officer, agent, or attorney-in-fact.

There should be executed an appropriate number of counterparts of the bond corresponding to the numberof counterparts of the Contract.

ACKNOWLEDGMENT OF PRINCIPAL IF A CORPORATION

State of NEW YORK County of NASSAU ss:

On this 2ND day of MAY, 2025 before me personally came ROBERT M. PASCUCCI,
to me known, who, being by me duly sworn did depose and say that he resides at
OYSTER BAY, NEW YORK; that he/she is the PRESIDENT
of the corporation described in and which executed the foregoing instrument; that he/she signed his/her name to the foregoing instrument by order of the directors of said corporation as the duly authorized and binding act thereof.

Notary Public or Commissioner of Deeds.

Barbara Jeanne McDermott
Notary Public, State of New Yok
Registration No. 01MC4979750
Qualified in Suffolk County
My Commission Expires November 6, 2027

ACKNOWLEDGMENT OF PRINCIPAL IF A PARTNERSHIP

State of_____ County of_____ss:

On this_____day of_____, 20_____before me personally came_____,
to me known, who, being by me duly sworn did depose and say that he/she resides at_____
_____; that he/she is_____partner of
_____, a limited/general partnership existing under the laws of the State of
_____, the partnership described in and which executed the foregoing instrument; and that he/she signed his/her name to the foregoing instrument as the duly authorized and binding act of said partnership.

Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL IF AN INDIVIDUAL

State of_____ County of_____ss:

On this_____day of_____, 20_____before me personally came_____,
to me known, who, being by me duly sworn did depose and say that he/she resides at_____
_____, and that he/she is the individual whose name is subscribed to the within instrument and acknowledged to me that by his/her signature on the instrument, said individual executed the instrument.

Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties; (b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bond is executed by agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

* * * * * * * *

Affix Acknowledgments and Justification of Sureties.

ACKNOWLEDGEMENT OF SURETY COMPANY

STATE OF New York

COUNTY OF **Nassau**

ON THE 1st DAY OF May, 2025 BEFORE ME PERSONALLY APPEARED Andrea E. Gorbert TO ME KNOWN, WHO BEING BY ME DULY SWORN, DID DEPOSE AND SAY; THAT (S)HE IS THE ATTORNEY-IN-FACT OF Developers Surety and Indemnity Company, THE CORPORATION THAT EXECUTED THE FOREGOING INSTRUMENT, AND ACKNOWLEDGED TO ME THAT SUCH CORPORATION EXECUTED THE SAME.

IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND AND AFFIXED MY OFFICIAL SEAL, AT MY OFFICE IN THE ABOVE COUNTY, THE DAY AND YEAR WRITTEN ABOVE.

Notary Public

LYNN M BARKER
STATE OF NEW YORK
NOTARY PUBLIC
Qualified in Suffolk County
01BA6347304
MY COMMISSION EXPIRES 08/29/2028

POWER OF ATTORNEY FOR
COREPOINTE INSURANCE COMPANY
DEVELOPERS SURETY AND INDEMNITY COMPANY
59 Maiden Lane, 43rd Floor, New York, NY 10038
(212) 220-7120

KNOW ALL BY THESE PRESENTS that, except as expressly limited herein, COREPOINTE INSURANCE COMPANY and DEVELOPERS SURETY AND INDEMNITY COMPANY, do hereby make, constitute and appoint:

Andrea E. Gorbert, Michael Marino, Mariya Leonidov, Krystal L. Stravato, Marisol Mojica, Jaclyn Maffey, William Grefe Griffin, Kristi Messel, Ryan Gray and Andreah Moran, of Whippany, NJ

as its true and lawful Attorney-in-Fact, to make, execute, deliver and acknowledge, for and on behalf of said companies, as sureties, bonds, undertakings and contracts of suretyship giving and granting unto said Attorney-in-Fact full power and authority to do and to perform every act necessary, requisite or proper to be done in connection therewith as each of said company could do, but reserving to each of said company full power of substitution and revocation, and all of the acts of said Attorney-in-Fact, pursuant to these presents, are hereby ratified and confirmed. This Power of Attorney is effective January 5, 2024 and shall expire on December 31, 2025.

This Power of Attorney is granted and is signed under and by authority of the following resolutions adopted by the Board of Directors of COREPOINTE INSURANCE COMPANY and DEVELOPERS SURETY AND INDEMNITY COMPANY (collectively, "Company") on February 10, 2023.

RESOLVED, that Sam Zaza, President, Surety Underwriting, James Bell, Vice President, Surety Underwriting, and Craig Dawson, Executive Underwriter, Surety, each an employee of AmTrust North America, Inc., an affiliate of the Company (the "Authorized Signors"), are hereby authorized to execute a Power of Attorney, qualifying attorney(s)-in-fact named in the Power of Attorney to execute, on behalf of the Company, bonds, undertakings and contracts of suretyship, or other suretyship obligations; and that the Secretary or any Assistant Secretary of the Company be, and each of them hereby is, authorized to attest the execution of any such Power of Attorney.

RESOLVED, that the signature of any one of the Authorized Signors and the Secretary or any Assistant Secretary of the Company, and the seal of the Company must be affixed to any such Power of Attorney, and any such signature or seal may be affixed by facsimile, and such Power of Attorney shall be valid and binding upon the Company when so affixed and in the future with respect to any bond, undertaking or contract of suretyship to which it is attached.

IN WITNESS WHEREOF, COREPOINTE INSURANCE COMPANY and DEVELOPERS SURETY AND INDEMNITY COMPANY have caused these presents to be signed by the Authorized Signor and attested by their Secretary or Assistant Secretary this March 27, 2023.

By: _____

Printed Name: Sam Zaza

Title: President, Surety Underwriting

COREPOINTE INSURANCE COMPANY CORPORATE SEAL DELAWARE

DEVELOPERS SURETY AND INDEMNITY COMPANY INCORPORATED 1936 CALIFORNIA

ACKNOWLEDGEMENT:

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF California COUNTY OF Orange

On this 27 day of March, 2023, before me, Hoang-Quyen Phu Pham, personally appeared Sam Zaza, who proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to within the instrument and acknowledged to me that they executed the same in their authorized capacity, and that by the signature on the instrument the entities upon behalf which the person acted, executed this instrument.

I certify, under penalty of perjury, under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____

HOANG-QUYEN P. PHAM
Notary Public - California
Orange County
Commission # 2432970
My Comm. Expires Dec 31, 2026

CORPORATE CERTIFICATION

The undersigned, the Secretary or Assistant Secretary of COREPOINTE INSURANCE COMPANY and DEVELOPERS SURETY AND INDEMNITY COMPANY, does hereby certify that the provisions of the resolutions of the respective Boards of Directors of said corporations set forth in this Power of Attorney are in force as of the date of this Certification.

This Certification is executed in the City of Cleveland, Ohio, this March 19, 2023.

DocuSigned by:
By: Barry W. Moses
6B6415E7ADE548C...
Barry W. Moses, Assistant Secretary

POA No. N/A

DocuSignEnvelopeID:3352BFD6-5E9D-4796-837E-C1E455E6530F

Ed. 0323

Signed and sealed this 1st day of May, 2025

Developers Surety and Indemnity Company

BALANCE SHEET AS OF DECEMBER 31, 2023

(Statutory Basis)

Assets

Cash and Invested Assets:	
Cash	$ 6,250,184
Bonds	489,146,748
Common Stocks	20,687,102
Receivable for Securities	26,386
Total Cash and Invested Assets	$516,110,420
Other Assets:	
Premium and Considerations	$ 152,503,318
Reinsurance Recoverable on Paid Losses	303,004
Receivable from Parent, Subsidiaries and Affiliates	3,556,228
Miscellaneous	66,358,934
Total Other Assets	$ 222,721,484
Total Assets	$ 738,831,904

Liabilities, Capital and Surplus

Liabilities:	
Outstanding Losses and Loss Expenses	$ 397,890,250
Unearned Premiums	127.447,943
Ceded Reinsurance Premium	4,199,368
Commissions, Taxes and Other Liabilities	48,345,467
Total Liabilities	$577,883,028
Capital and Surplus:	
Common Capital Stock	$ 3,100,000
Gross Paid In and Contributed Surplus	88,003,432
Unassigned Funds (Surplus)	48,542,724
Special Surplus-Retroactive Reinsurance	21.302.720
Total Equity	$ 160,948,876
Total Liabilities and Equity	$ 738,831,904

Valuation of securities were provided by pricing service Interactive Data (IDC)

CERTIFICATION

I, Christopher Foy, President of Developers Surety and Indemnity Company, hereby certify that the foregoing is a full, true and correct copy of the Balance sheet of said Corporation, as of December 31, 2023.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of said Corporation on this 10th day of May 2024.

President

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF NEW YORK
COUNTY OF NEW YORK

On this 9th day of May 2024, before me, Patricia A. Nelson, a Notary Public, personally appeared, Christopher Foy, who proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument and the person, or the entity upon behalf of which the person acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of New York that the foregoing paragraph is true and correct.

Witness my hand and official seal.

Signature _____
Signature of Notary Public

PATRICIA A. NELSON
STATE OF NEW YORK
NOTARY PUBLIC
Qualified in Queens County
01NE6371748
MY COMMISSION EXPIRES 03/05/2026

ID-2023 (DSI) (Rev. 5/24)

PAYMENT BOND

Use for any contract for which a Payment Bond is required.

PAYMENT BOND (Page 1)

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS, That we, Jobco Incorporated

3333 New Hyde Park Rd, Suite 200

New Hyde Park, NY 11042

hereinafter referred to as the "Principal", and Developers Surety and Indemnity Company

P.O. BOX 19725

Irvine, CA 92623-9725

hereinafter referred to as the "Surety" ("Sureties") are held and firmly bound to THE CITY OF NEW YORK, hereinafter referred to as the "City" or to its successors and assigns, in the penal sum of

Twelve Million Seven Hundred Forty-Three Thousand Three Hundred Thirty-Three

and 00/100 Dollars

($12,743,333.00) Dollars, lawful money of the United States, for the payment of which said sum of money well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal is about to enter, or has entered, into a Contract in writing with the City for

Project ID: LQASADA - Astoria Branch Library Renovation

a copy of which Contract is annexed to and hereby made a part of this bond as though herein set forth in full;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal, his or its representatives or assigns and other Subcontractors to whom Work under this Contract is sublet and his or their successors and assigns shall promptly pay or cause to be paid all lawful claims for

(a) Wages and compensation for labor performed and services rendered by all persons engaged in the prosecution of the Work under said Contract, and any amendment or extension thereof or addition thereto, whether such persons be agents servants or employees of the Principal or any such Subcontractor, including all persons so engaged who perform the work of laborers or mechanics at or in the vicinity of the site of the Project regardless of any contractual relationship between the Principal or such Subcontractors, or his or their successors or assigns, on the one hand and such laborers or mechanics on the other, but not including office employees not regularly stationed at the site of the project; and

(b) Materials and supplies (whether incorporated in the permanent structure or not), as well as teams, fuels, oils, implements or machinery furnished, used or consumed by said Principal or any subcontractor at or in the vicinity of the site of the Project in the prosecution of the Work under said Contract and any amendment or extension thereof or addition thereto; then this obligation shall be void, otherwise to remain infull force and effect.

This bond is subject to the following additional conditions, limitations and agreements:

(a) The Principal and Surety (Sureties) agree that this bond shall be for the benefit of any materialmen or laborer having a just claim, as well as the City itself.

(b) All persons who have performed labor, rendered services or furnished materials and supplies,as aforesaid, shall have a direct right of action against the Principal and his, its or their successors and assigns, and the Surety (Sureties) herein, or against either or both or any of them and their successors and assigns. Such persons may sue in their own name, and may prosecute the suit to judgment and execution without the necessity of joining with any other persons as party plaintiff.

(c) The Principal and Surety (Sureties) agree that neither of them will hold the City liable for any judgment for costs of otherwise, obtained by either or both of them against a laborer or materialman in a suit brought by either a laborer or materialman under this bond for moneys allegedly due for performing work or furnishing material.

(d) The Surety (Sureties) or its successors and assigns shall not be liable for any compensation recoverable by an employee or laborer under the Workmen's Compensation Law.

(e) In no event shall the Surety (Sureties), or its successors or assigns, be liable for a greater sum than the penalty of this bond or be subject to any suit, action or proceeding hereon that is instituted by any person, firm, or corporation hereunder later than two years after the complete performance of said Contract and final settlement thereof.

The Principal, for himself and his successors and assigns, and the Surety (Sureties), for itself and its successors and assigns, do hereby expressly waive any objection that might be interposed as to the rightof the City to require a bond containing the foregoing provisions, and they do hereby further expressly waiveany defense which they or either of them might interpose to an action brought hereon by any person, firm or corporation, including subcontractors, materialmen and third persons, for work, labor, services, supplies or material performed rendered, or furnished as aforesaid upon the ground that there is no law authorizing the City to require the foregoing provisions to be place in this bond.

And the Surety (Sureties), for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of said Surety (Sureties), and its bonds shall be in no way impaired or affected by any extension of time, modification, omission, addition, or change in or of the said Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any part thereof, or of any Work to be performed, or any moneys due to become due thereunder and said Surety (Sureties) does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers, and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, Subcontractors, and other transferees shall have the same effect as to said Surety (Sureties) as though done or omitted to be done or in relation to said Principal.

IN WITNESS WHEREOF, the Principal and the Surety (Sureties) have hereunto set their handsand seals, and such of them as are corporations have caused their corporate seals to be hereunto affixed and these presents to be signed by their proper officers, this 1st day of May, 2025.

(Seal) Jobco Incorporated (L.S.)Principal

By: _____

(Seal) Developers Surety and Indemnity Company Surety

By: _____
Andrea E. Gorbert, Attorney-in-Fact

(Seal) _____ Surety

By: _____

(Seal) _____ Surety

By: _____

(Seal) _____ Surety

By: _____

If the Contractor (Principal) is a partnership, the bond should be signed by each of the individuals who are partners.

If the Contractor (Principal) is a corporation, the bond should be signed in its correct corporate name by aduly authorized officer, agent, or attorney-in-fact.

There should be executed an appropriate number of counterparts of the bond corresponding to the numberof counterparts of the Contract.

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of NEW YORK County of NASSAU ss:

On this 2ND day of MAY, 2025, before me personally came ROBERT M. PASCUCCI to me known, who, being by me duly sworn did depose and say that he resides at OYSTER BAY, NEW YORK that he is the PRESIDENT of the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the directors of said corporation, and that he signed his name thereto by like order.

Barbara Jeanne McDermott
Notary Public, State of New Yok
Registration No. 01MC4979750
Qualified in Suffolk County
My Commission Expires November 6, 2027

Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF A PARTNERSHIP

State of_____County of_____ss:

On this_____day of_____,_____, before me personally appeared _____ to me known, and known to me to be one of the members of the firm of _____ _____ described in and who executed the foregoing instrument; and he acknowledged to me that he executed the same as and for the act and deed of said firm.

Notary Public or Commissioner of Deeds

ACKNOWLEDGMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of_____County of_____ss:

On this _____ day of_____,_____, before me personally appeared _____ to me known, and known to me to be the person described in and who executed the foregoing instrument; and acknowledged that he executed the same.

Notary Public or Commissioner of Deeds

Each executed bond should be accompanied by: (a) appropriate acknowledgments of the respective parties; (b) appropriate duly certified copy of Power of Attorney or other certificate of authority where bondis executed by agent, officer or other representative of Principal or Surety; (c) a duly certified extract from By-Laws or resolutions of Surety under which Power of Attorney or other certificate of authority of its agent, officer or representative was issued, and (d) certified copy of latest published financial statement of assets and liabilities of Surety.

* * * * * * * *

Affix Acknowledgments and Justification of Sureties.

ACKNOWLEDGEMENT OF SURETY COMPANY

STATE OF New York

COUNTY OF **Nassau**

ON THE 1st DAY OF May, 2025 BEFORE ME PERSONALLY APPEARED Andrea E. Gorbert TO ME KNOWN, WHO BEING BY ME DULY SWORN, DID DEPOSE AND SAY; THAT (S)HE IS THE ATTORNEY-IN-FACT OF Developers Surety and Indemnity Company, THE CORPORATION THAT EXECUTED THE FOREGOING INSTRUMENT, AND ACKNOWLEDGED TO ME THAT SUCH CORPORATION EXECUTED THE SAME.

IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND AND AFFIXED MY OFFICIAL SEAL, AT MY OFFICE IN THE ABOVE COUNTY, THE DAY AND YEAR WRITTEN ABOVE.

LYNN M BARKER
STATE OF NEW YORK
NOTARY PUBLIC
Qualified in Suffolk County
01BA6347304
MY COMMISSION EXPIRES 08/29/2028

Notary Public

POWER OF ATTORNEY FOR
COREPOINTE INSURANCE COMPANY
DEVELOPERS SURETY AND INDEMNITY COMPANY
59 Maiden Lane, 43rd Floor, New York, NY 10038
(212) 220-7120

KNOW ALL BY THESE PRESENTS that, except as expressly limited herein, COREPOINTE INSURANCE COMPANY and DEVELOPERS SURETY AND INDEMNITY COMPANY, do hereby make, constitute and appoint:

Andrea E. Gorbert, Michael Marino, Mariya Leonidov, Krystal L. Stravato, Marisol Mojica, Jaclyn Maffey, William Grefe Griffin, Kristi Messel, Ryan Gray and Andreah Moran, of Whippany, NJ

as its true and lawful Attorney-in-Fact, to make, execute, deliver and acknowledge, for and on behalf of said companies, as sureties, bonds, undertakings and contracts of suretyship giving and granting unto said Attorney-in-Fact full power and authority to do and to perform every act necessary, requisite or proper to be done in connection therewith as each of said company could do, but reserving to each of said company full power of substitution and revocation, and all of the acts of said Attorney-in-Fact, pursuant to these presents, are hereby ratified and confirmed. This Power of Attorney is effective January 5, 2024 and shall expire on December 31, 2025.

This Power of Attorney is granted and is signed under and by authority of the following resolutions adopted by the Board of Directors of COREPOINTE INSURANCE COMPANY and DEVELOPERS SURETY AND INDEMNITY COMPANY (collectively, "Company") on February 10, 2023.

RESOLVED, that Sam Zaza, President, Surety Underwriting, James Bell, Vice President, Surety Underwriting, and Craig Dawson, Executive Underwriter, Surety, each an employee of AmTrust North America, Inc., an affiliate of the Company (the "Authorized Signors"), are hereby authorized to execute a Power of Attorney, qualifying attorney(s)-in-fact named in the Power of Attorney to execute, on behalf of the Company, bonds, undertakings and contracts of suretyship, or other suretyship obligations; and that the Secretary or any Assistant Secretary of the Company be, and each of them hereby is, authorized to attest the execution of any such Power of Attorney.

RESOLVED, that the signature of any one of the Authorized Signors and the Secretary or any Assistant Secretary of the Company, and the seal of the Company must be affixed to any such Power of Attorney, and any such signature or seal may be affixed by facsimile, and such Power of Attorney shall be valid and binding upon the Company when so affixed and in the future with respect to any bond, undertaking or contract of suretyship to which it is attached.

IN WITNESS WHEREOF, COREPOINTE INSURANCE COMPANY and DEVELOPERS SURETY AND INDEMNITY COMPANY have caused these presents to be signed by the Authorized Signor and attested by their Secretary or Assistant Secretary this March 27, 2023.

By: Sam Zaza

Printed Name: Sam Zaza

Title: President, Surety Underwriting

COREPOINTE INSURANCE COMPANY CORPORATE SEAL DELAWARE

DEVELOPERS SURETY AND INDEMNITY COMPANY INCORPORATED 1936 CALIFORNIA

ACKNOWLEDGEMENT:

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF California COUNTY OF Orange

On this 27 day of March, 2023, before me, Hoang-Quyen Phu Pham, personally appeared Sam Zaza, who proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to within the instrument and acknowledged to me that they executed the same in their authorized capacity, and that by the signature on the instrument the entities upon behalf which the person acted, executed this instrument.

I certify, under penalty of perjury, under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature Hoang-Quyen Pham

HOANG-QUYEN P. PHAM
Notary Public - California
Orange County
Commission # 2432970
My Comm. Expires Dec 31, 2026

CORPORATE CERTIFICATION

The undersigned, the Secretary or Assistant Secretary of COREPOINTE INSURANCE COMPANY and DEVELOPERS SURETY AND INDEMNITY COMPANY, does hereby certify that the provisions of the resolutions of the respective Boards of Directors of said corporations set forth in this Power of Attorney are in force as of the date of this Certification.

This Certification is executed in the City of Cleveland, Ohio, this March 19, 2023.

DocuSigned by:

By: Barry W. Moses — Barry W. Moses, Assistant Secretary — POA No. N/A

6B6415E7ADE548C...

DocuSignEnvelopeID:3352BFD6-5E9D-4796-837E-C1E455E6530F

Ed. 0323

Signed and sealed this 1st day of May, 2025

Developers Surety and Indemnity Company

BALANCE SHEET AS OF DECEMBER 31, 2023

(Statutory Basis)

Assets

Cash and Invested Assets:	
Cash	$ 6,250,184
Bonds	489,146,748
Common Stocks	20,687,102
Receivable for Securities	26,386
Total Cash and Invested Assets	$516,110,420
Other Assets:	
Premium and Considerations	$ 152,503,318
Reinsurance Recoverable on Paid Losses	303,004
Receivable from Parent, Subsidiaries and Affiliates	3,556,228
Miscellaneous	66,358,934
Total Other Assets	$ 222,721,484
Total Assets	$ 738,831,904

Liabilities, Capital and Surplus

Liabilities:	
Outstanding Losses and Loss Expenses	$ 397,890,250
Unearned Premiums	127.447,943
Ceded Reinsurance Premium	4,199,368
Commissions, Taxes and Other Liabilities	48,345,467
Total Liabilities	$577,883,028
Capital and Surplus:	
Common Capital Stock	$ 3,100,000
Gross Paid In and Contributed Surplus	88,003,432
Unassigned Funds (Surplus)	48,542,724
Special Surplus-Retroactive Reinsurance	21.302.720
Total Equity	$ 160,948,876
Total Liabilities and Equity	$ 738,831,904

Valuation of securities were provided by pricing service Interactive Data (IDC)

CERTIFICATION

I, Christopher Foy, President of Developers Surety and Indemnity Company, hereby certify that the foregoing is a full, true and correct copy of the Balance sheet of said Corporation, as of December 31, 2023.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of said Corporation on this 10th day of May 2024.

President

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF NEW YORK
COUNTY OF NEW YORK

On this 9th day of May 2024, before me, Patricia A. Nelson, a Notary Public, personally appeared, Christopher Foy, who proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument and the person, or the entity upon behalf of which the person acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of New York that the foregoing paragraph is true and correct.

Witness my hand and official seal.

Signature _____
Signature of Notary Public

PATRICIA A. NELSON
STATE OF NEW YORK
NOTARY PUBLIC
Qualified in Queens County
01NE6371748
MY COMMISSION EXPIRES 03/05/2026

ID-2023 (DSI) (Rev. 5/24)

LABOR LAW ARTICLE 8 - NYC PUBLIC WORKS

Workers, Laborers and Mechanics employed on a public work project must receive not less than the prevailing rate of wage and benefits for the classification of work performed by each upon such public work. Pursuant to New York Labor Law Article 8 the Comptroller of the City of New York has promulgated this schedule solely for Workers, Laborers and Mechanics engaged by private contractors on New York City public work projects. Prevailing rates are required to be annexed to and form part of the public work contract pursuant to Labor Law section 220 (3).

This schedule is a compilation of separate determinations of the prevailing rate of wage and supplements made by the Comptroller for each trade classification listed herein pursuant to Labor Law section 220 (5). The source of the wage and supplement rates, whether a collective bargaining agreement, survey data or other, is listed at the end of each classification.

Agency Chief Contracting Officers should contact the Bureau of Labor Law's Classification Unit with any questions concerning trade classifications, prevailing rates or prevailing practices with respect to procurement on New York City public work contracts. Contractors are advised to review the Comptroller's Prevailing Wage Schedule before bidding on public work contracts. Contractors with questions concerning trade classifications, prevailing rates or prevailing practices with respect to public work contracts in the procurement stage must contact the contracting agency responsible for the procurement.

Any error as to compensation under the prevailing wage law or other information as to trade classification, made by the contracting agency in the contract documents or in any other communication, will not preclude a finding against the contractor of prevailing wage violation.

Any questions concerning trade classifications, prevailing rates or prevailing practices on New York City public work contracts that have already been awarded may be directed to the Bureau of Labor Law's Classification Unit by calling (212) 669-4443. All callers must have the agency name and contract registration number available when calling with questions on public work contracts. Please direct all other compliance issues to: laborlaw@comptroller.nyc.gov or Bureau of Labor Law, Attn: Paul Brumlik, Office of the Comptroller, 1 Centre Street, Room 651, New York, N.Y. 10007.

Pursuant to Labor Law § 220 (3-a) (a), the appropriate schedule of prevailing wages and benefits must be posted in a prominent and accessible place at all public work sites along with the Construction Poster provided on our web site at comptroller.nyc.gov/wages. In addition, covered employees must be given the appropriate schedule of prevailing wages and benefits along with the Worker Notice provided on our web site at the time the public work project begins, and with the first paycheck to each such employee after July first of each year.

This schedule is applicable to work performed during the effective period, unless otherwise noted. Changes to this schedule are published on our web site comptroller.nyc.gov/wages. Contractors must pay the wages and supplements in effect when the worker, laborer, mechanic performs the work. Preliminary schedules for future one-year periods appear in the City Record on or about June 1 each succeeding year. Final schedules appear on or about July 1 in the City Record and on our web site comptroller.nyc.gov/wages.

Prevailing rates and ratios for apprentices are published in the Construction Apprentice Prevailing Wage Schedule. Pursuant to Labor Law § 220 (3-e), only apprentices who are individually registered in a bona fide program to which the employer contractor is a participant, registered with the

New York State Department of Labor, may be paid at the apprentice rates. Apprentices who are not so registered must be paid as journey persons.

New York City public work projects awarded pursuant to a Project Labor Agreement ("PLA") in accordance with Labor Law section 222 may have different labor standards for shift, premium and overtime work. Please refer to the PLA's pre-negotiated labor agreements for wage and benefit rates applicable to work performed outside of the regular workday. More information is available at the Mayor's Office of Contract Services (MOCS) web page at:

https://www1.nyc.gov/site/mocs/legal-forms/project-labor-agreements.page

All the provisions of Labor Law Article 8 remain applicable to PLA work including, but not limited to, the enforcement of prevailing wage requirements by the Comptroller in accordance with the trade classifications in this schedule; however, we will enforce shift, premium, overtime and other non-standard rates as they appear in a project's pre-negotiated labor agreement.

In order to meet their obligation to provide prevailing supplemental benefits to each covered employee, employers must either:

1) **Provide bona fide fringe benefits which cost the employer no less than the prevailing supplemental benefits rate; or**
2) **Supplement the employee's hourly wage by an amount no less than the prevailing supplemental benefits rate; or**
3) **Provide a combination of bona fide fringe benefits and wage supplements which cost the employer no less than the prevailing supplemental benefits rate in total.**

Although prevailing wage laws do not require employers to provide bona fide fringe benefits (as opposed to wage supplements) to their employees, other laws may. For example, the Employee Retirement Income Security Act, 29 U.S.C. § 1001 et seq., the Patient Protection and Affordable Care Act, 42 U.S.C. § 18001 et seq., and the New York City Paid Sick Leave Law, N.Y.C. Admin. Code § 20-911 et seq., require certain employers to provide certain benefits to their employees. Labor agreements to which employers are a party may also require certain benefits. The Comptroller's Office does not enforce these laws or agreements.

Employers must provide prevailing supplemental benefits at the straight time rate for each hour worked unless otherwise noted in the classification.

Paid Holidays, Vacation and Sick Leave when listed must be paid or provided in addition to the prevailing hourly supplemental benefit rate.

For more information, please refer to the Comptroller's Prevailing Wage Law Regulations in Title 44 of the Rules of the City of New York, Chapter 2, available at comptroller.nyc.gov/wages.

Paul Brumlik
Director of Classifications
Bureau of Labor Law

ADDENDUM

List of Amended Classifications

1. BOILERMAKER
2. CORE DRILLER
3. DERRICKPERSON AND RIGGER
4. FLAGGER
5. FLOOR COVERER
6. HAZARDOUS MATERIAL HANDLER
7. HOUSE WRECKER
8. IRON WORKER - ORNAMENTAL
9. IRON WORKER – STRUCTURAL
10. LABORER - HEAVY & HIGHWAY
11. LABORER - PAVER & ROADBUILDER
12. LABORER - PAVER & ROADBUILDER LINE STRIPING (ROADWAY)
13. MARBLE MECHANIC
14. MASON TENDER
15. MOSAIC MECHANIC
16. PAINTER - BRIDGE & STRUCTURAL STEEL
17. PLASTERER - TENDER
18. PLUMBER (MECHNICAL EQUIPMENT AND SERVICE)
19. SHEET METAL WORKER
20. SHEET METAL WORKER - SPECIALTY
21. STEAMFITTER
22. TAPER
23. TILE FINISHER
24. TILE LAYER – SETTER
25. TUNNEL WORKER

TABLE OF CONTENTS

CLASSIFICATION	PAGE
ASBESTOS HANDLER	6
BLASTER	6
BOILERMAKER	7
BRICKLAYER	8
CARPENTER - BUILDING COMMERCIAL	9
CARPENTER - HEAVY CONSTRUCTION WORK	10
CARPENTER - HIGH RISE CONCRETE FORMS	11
CARPENTER - SIDEWALK SHED, SCAFFOLD AND HOIST	12
CARPENTER - WOOD WATER STORAGE TANK	13
CEMENT & CONCRETE WORKER	14
CEMENT MASON	15
CORE DRILLER	16
DERRICKPERSON AND RIGGER	17
DIVER	19
DOCKBUILDER - PILE DRIVER	19
DRIVER: TRUCK (TEAMSTER)	20
ELECTRICIAN	23
ELECTRICIAN - ALARM TECHNICIAN	25
ELECTRICIAN-STREET LIGHTING WORKER	26
ELEVATOR CONSTRUCTOR	28
ELEVATOR REPAIR & MAINTENANCE	29
ENGINEER	30
ENGINEER - CITY SURVEYOR AND CONSULTANT	35
ENGINEER - FIELD (BUILDING CONSTRUCTION)	36
ENGINEER - FIELD (HEAVY CONSTRUCTION)	37
ENGINEER - FIELD (STEEL ERECTION)	38
ENGINEER - OPERATING	39
FLAGGER	47
FLOOR COVERER	47
GLAZIER	48
GLAZIER - REPAIR & MAINTENANCE	49
HAZARDOUS MATERIAL HANDLER	50
HEAT AND FROST INSULATOR	51
HOUSE WRECKER	52
IRON WORKER - ORNAMENTAL	53
IRON WORKER - STRUCTURAL	54
LABORER	55
LABORER – HEAVY & HIGHWAY	55
LABORER - PAVER & ROADBUILDER	56
LABORER - PAVER & ROADBUILDER LINE STRIPING (ROADWAY)	58

LANDSCAPING 59
MARBLE MECHANIC 61
MASON TENDER 62
MASON TENDER (INTERIOR DEMOLITION WORKER) 63
METALLIC LATHER 64
MILLWRIGHT 65
MOSAIC MECHANIC 66
PAINTER 67
PAINTER - BRIDGE & STRUCTURAL STEEL 68
PAINTER - METAL POLISHER 69
PAINTER - SIGN 70
PAPERHANGER 71
PAVER AND ROADBUILDER 72
PAVER AND ROADBUILDER - LINE STRIPING (ROADWAY) 72
PLASTERER 72
PLASTERER - TENDER 73
PLUMBER 74
PLUMBER (MECHNICAL EQUIPMENT AND SERVICE) 75
PLUMBER (RESIDENTIAL RATES FOR 1, 2 AND 3 FAMILY HOME CONSTRUCTION) 76
PLUMBER: PUMP & TANK 77
POINTER, WATERPROOFER, CAULKER, SANDBLASTER, STEAMBLASTER 78
ROOFER 79
SHEET METAL WORKER 79
SHEET METAL WORKER - SPECIALTY 81
SHIPYARD WORKER 82
SIGN ERECTOR 83
STEAMFITTER 84
STEAMFITTER - REFRIGERATION AND AIR CONDITIONER 85
STONE MASON - SETTER 86
TAPER 87
TELECOMMUNICATION WORKER 87
TILE FINISHER 89
TILE LAYER - SETTER 90
TIMBERPERSON 90
TUNNEL WORKER 91
UTILITY LOCATOR 93
WELDER 95

ASBESTOS HANDLER

SEE HAZARDOUS MATERIAL HANDLER

BLASTER

Blaster

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $58.21
Supplemental Benefit Rate per Hour: $54.03

Blaster - Hydraulic Trac Drill

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $52.35
Supplemental Benefit Rate per Hour: $54.03

Blaster - Wagon: Air Trac: Quarry Bar: Drillrunners

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $51.52
Supplemental Benefit Rate per Hour: $54.03

Blaster - Journeyperson

(Laborer, Chipper/Jackhammer including Walk Behind Self Propelled Hydraulic Asphalt and Concrete Breakers and Hydro (Water) Demolition, Powder Carrier, Hydraulic Chuck Tender, Chuck Tender and Nipper)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $45.00
Supplemental Benefit Rate per Hour: $54.03

Blaster - Magazine Keepers: (Watch Person)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $22.50
Supplemental Benefit Rate per Hour: $54.03

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.

Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day
Christmas Day

Paid Holidays

Labor Day
Thanksgiving Day

Shift Rates

When two shifts are employed, single time rate shall be paid for each shift. When three shifts are found necessary, each shift shall work seven and one half hours (7 ½), but shall be paid for eight (8) hours of labor, and be permitted one half hour for lunch.

(Local #731)

BOILERMAKER

Boilermaker

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $67.38
Supplemental Benefit Rate per Hour: $49.33
Supplemental Note: For time and one half overtime - $73.42 For double overtime - $97.51

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $68.88
Supplemental Benefit Rate per Hour: $49.83
Supplemental Note: For time and one half overtime - $74.17 For double overtime - $98.51

Overtime Description

For Repair and Maintenance work:
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
For New Construction work:
Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day

Quadruple time the regular rate for work on the following holiday(s).
Labor Day

Paid Holidays

Good Friday
Day after Thanksgiving
Day before Christmas
Day before New Year's Day

Shift Rates

On jobs requiring two (2) or three (3) shifts, the first shift shall work eight (8) hours at the regular straight-time hourly rate. The second shift shall work eight (8) hours and receive eight hours at the regular straight time hourly rate plus two dollars ($2.00) per hour. The third shift shall work eight (8) hours and receive eight hours at the regular straight time hourly rate plus two dollars and twenty-five cents ($2.25) per hour.

(Local #5)

BRICKLAYER

Bricklayer

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $59.09
Supplemental Benefit Rate per Hour: $43.05

Overtime Description

Time and one half the regular rate after a 7 hour day. If working on a job that is predominately Pointer, Cleaner, Caulker work, then Time and one half the regular rate after an 8 hour day.

Overtime

Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays

None

Shift Rates

The second shift wage rate shall be a 15% wage premium with no premium for supplemental benefits. There must be a first shift in order to work a second shift. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, eight hours will be paid at straight time rate for seven hours of work.

(Bricklayer District Council)

CARPENTER - BUILDING COMMERCIAL

Building Commercial

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $57.05
Supplemental Benefit Rate per Hour: $48.33

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day

Columbus Day
Presidential Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
The second shift will receive one hour at the double time rate of pay for the last hour of the shift; eight hours pay for seven hours of work, nine hours pay for eight hours of work. There must be a first shift in order to work a second shift. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

(Carpenters District Council)

CARPENTER - HEAVY CONSTRUCTION WORK
(Construction of Engineered Structures and Building Foundations including all form work)

Heavy Construction Work

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $60.59
Supplemental Benefit Rate per Hour: $55.84

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
Off shift work commencing between 5:00 P.M. and 11:00 P.M. shall work eight and one half hours allowing for one half hour for lunch. The wage rate shall be 113% of the straight time hourly wage rate and the supplemental benefits shall be paid at the straight time rate. When two (2) or more shifts of Carpenters are employed, single time will be paid for each shift.

(Carpenters District Council)

CARPENTER - HIGH RISE CONCRETE FORMS
(Excludes Engineered Structures and Building Foundations)

Carpenter High Rise A

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $51.48
Supplemental Benefit Rate per Hour: $44.74

Carpenter High Rise B

Carpenter High Rise B worker is excluded from high risk operations such as erection decking, perimeter debris netting, leading edge work, self-climbing form systems, and the installation of cocoon systems unless directly supervised by a Carpenter High Rise A worker.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $40.89
Supplemental Benefit Rate per Hour: $18.05

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day

Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
The second shift wage rate shall be 113% of the straight time hourly wage rate. However, any shift beginning after 5:00 P.M. shall be paid at time and one half the regular hourly rate. There must be a first shift in order to work a second shift. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

(Carpenters District Council)

CARPENTER - SIDEWALK SHED, SCAFFOLD AND HOIST

Carpenter - Hod Hoist

(Assisted by Mason Tender)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $55.00
Supplemental Benefit Rate per Hour: $48.90

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day

Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
The second shift will receive 112% of the straight time hourly rate. Benefit fund contributions shall be paid at the straight time rate. There must be a first shift in order to work a second shift. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

(Carpenters District Council)

CARPENTER - WOOD WATER STORAGE TANK

Tank Mechanic

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $37.83
Supplemental Benefit Rate per Hour: $25.32

Tank Helper

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $29.69
Supplemental Benefit Rate per Hour: $25.32

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Time and one half the regular rate for work on a holiday plus the day's pay.

Paid Holidays
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day
Day after Thanksgiving
1/2 day on Christmas Eve if work is performed in the A.M.
Christmas Day

1/2 day on New Year's Eve if work is performed in the A.M.

Vacation

Employed for one (1) year.....one (1) week vacation (40 hours)
Employed for three (3) years.....two (2) weeks vacation (80 hours)
Employed for more than twenty (20) years.....three (3) weeks vacation (120 hours)

SICK LEAVE:
Two (2) sick days after being employed for twenty (20) years.

(Carpenters District Council)

CEMENT & CONCRETE WORKER

Building Work

Cement & Concrete Worker

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $47.28
Supplemental Benefit Rate per Hour: $32.20
Supplemental Note: $36.70 on Saturdays; $41.20 on Sundays & Holidays

Cement & Concrete Worker - (Hired after 2/6/2016)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $36.80
Supplemental Benefit Rate per Hour: $24.20
Supplemental Note: $26.70 on Saturdays; $29.20 on Sundays & Holidays

Overtime Description

Time and one half the regular rate after 7 hour day (time and one half the regular rate after an 8 hour day when working with Dockbuilders on pile cap forms and for work below street level to the top of the foundation wall, not to exceed 2 feet or 3 feet above the sidewalk-brick shelf, when working on the foundation and structure.)

Overtime

Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day

Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays

1/2 day before Christmas Day
1/2 day before New Year's Day

Shift Rates

On shift work extending over a twenty-four hour period, all shifts are paid at straight time.

(Cement & Concrete Workers District Council 16)

CEMENT MASON

Cement Mason

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $57.72
Supplemental Benefit Rate per Hour: $34.51
Supplemental Note: Supplemental benefit time and one half rate: $62.72; Double time rate: double the base supplemental benefit rate.

Overtime Description

Time and one-half the regular rate after an 8 hour day, double time the regular rate after 10 hours. Time and one-half the regular rate on Saturday, double time the regular rate after 10 hours. Double time the regular rate on Sunday. Four Days a week at Ten (10) hours straight time is allowed.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays

Any worker who reports to work on Christmas Eve or New Year's Eve pursuant to his employer's instruction shall be entitled to three (3) hours afternoon pay without working.

Shift Rates

For off shift work, (at times other than the regular 7:00 A.M. to 3:30 P.M. work day) a cement mason shall be paid at the regular hourly rate plus a 25% per hour differential.

(Local #780) (BCA)

CORE DRILLER

Test Boring

Core Driller

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $46.25
Supplemental Benefit Rate per Hour: $33.36

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $47.88
Supplemental Benefit Rate per Hour: $34.35

Core Driller Helper

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $36.28
Supplemental Benefit Rate per Hour: $33.36

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $37.58
Supplemental Benefit Rate per Hour: $34.35

Core Driller Helper(Third year in the industry)

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $32.62
Supplemental Benefit Rate per Hour: $33.36

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $33.80
Supplemental Benefit Rate per Hour: $34.35

Core Driller Helper (Second year in the industry)

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $28.98

Supplemental Benefit Rate per Hour: $33.36

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $30.04
Supplemental Benefit Rate per Hour: $34.35

Core Driller Helper (First year in the industry)

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $25.32
Supplemental Benefit Rate per Hour: $33.36

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $26.26
Supplemental Benefit Rate per Hour: $34.35

Overtime Description
Time and one half the regular rate for work on a holiday plus Holiday pay when worked.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
Memorial Day
Independence Day
Labor Day
Veteran's Day
Thanksgiving Day
Christmas Day

Shift Rates
When two (2) or more shifts are employed, single time shall be paid for each shift, but those employees employed on a shift other than from 8:00 A.M. to 5:00 P.M. shall, in addition, receive two dollars ($2.00) per hour differential for each hour worked. When three (3) shifts are needed, each shift shall work seven and one-half (7 ½) hours paid for eight (8) hours of labor and be permitted one-half (½) hour for mealtime.

(Carpenters District Council)

DERRICKPERSON AND RIGGER

Derrick Person & Rigger

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $60.40
Supplemental Benefit Rate per Hour: $60.14

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $60.40
Supplemental Benefit Rate per Hour: $61.78

Derrick Person & Rigger - Site Work

Assists the Stone Mason-Setter in the setting of stone and paving stone.

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $47.54
Supplemental Benefit Rate per Hour: $47.70

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $47.93
Supplemental Benefit Rate per Hour: $48.70

Overtime Description
The first two hours of overtime on weekdays and the first seven hours of work on Saturdays are paid at time and one half for wages and supplemental benefits. All additional overtimes is paid at double time for wages and supplemental benefits.

Overtime
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Washington's Birthday
Good Friday
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day on Christmas Eve if work is performed in the A.M.

(Local #197)

DIVER

Diver (Marine)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $75.46
Supplemental Benefit Rate per Hour: $55.84

Diver Tender (Marine)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $55.00
Supplemental Benefit Rate per Hour: $55.84

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
When three shifts are utilized each shift shall work seven and one half-hours (7 1/2 hours) and paid for 8 hours, allowing for one half hour for lunch.

(Carpenters District Council)

DOCKBUILDER - PILE DRIVER

Dockbuilder - Pile Driver

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $60.59
Supplemental Benefit Rate per Hour: $55.84

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
Off shift work commencing between 5:00 P.M. and 11:00 P.M. shall work eight and one half hours allowing for one half hour for lunch. The wage rate shall be 113% of the straight time hourly wage rate and the supplemental benefits shall be paid at the straight time rate. When two (2) or more shifts of Dockbuilders are employed, single time will be paid for each shift.

(Carpenters District Council)

DRIVER: TRUCK (TEAMSTER)

Driver - Dump Truck

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $44.17
Supplemental Benefit Rate per Hour: $59.15
Supplemental Note: Over 40 hours worked: at time and one half rate - $25.50; at double time rate - $34.00

Driver - Tractor Trailer

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $47.32
Supplemental Benefit Rate per Hour: $56.90
Supplemental Note: Over 40 hours worked: at time and one half rate - $25.50; at double time rate - $34.00

Driver - Euclid & Turnapull Operator

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $47.88
Supplemental Benefit Rate per Hour: $56.90
Supplemental Note: Over 40 hours worked: at time and one half rate - $25.50; at double time rate - $34.00

Overtime Description

For Paid Holidays: Holiday pay for all holidays shall be prorated based two hours per day for each day worked in the holiday week, not to exceed 8 hours of holiday pay. For Thanksgiving week, the prorated share shall be 5 1/3 hours of holiday pay for each day worked in Thanksgiving week.

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day

Shift Rates

Off shift work commencing between 6:00 P.M. and 5:00 A.M. shall work eight and one half (8 1/2) hours allowing for one half hour for lunch

Driver Redi-Mix (Sand & Gravel)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $43.29
Supplemental Benefit Rate per Hour: $50.77
Supplemental Note: Over 40 hours worked: time and one half rate $20.48; double time rate $27.30

Overtime Description

For Paid Holidays: Employees who do not work on a contractual holiday shall be compensated two (2) hours extra pay in straight time wages and benefits for every day on which the Employee does not pass up a day's work during the calendar week (Sunday through Saturday) of the holiday, up to a maximum of ten (10) hours in wages and eight (8) hours in benefit contributions for the holiday

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
Martin Luther King Jr. Day
President's Day
Columbus Day
Veteran's Day

Triple time the regular rate for work on the following holiday(s).
New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Thanksgiving Day
Christmas Day

(Local #282)

ELECTRICIAN

(Including installation of low voltage cabling carrying data, video and/or voice on building construction/alteration/renovation projects.)

Electrician "A" (Regular Day / Day Shift)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $62.00
Supplemental Benefit Rate per Hour: $62.25
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician "A" (Regular Day Overtime after 7 hrs / Day Shift Overtime after 8 hrs)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $93.00
Supplemental Benefit Rate per Hour: $64.24
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician "A" (Swing Shift)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $72.75
Supplemental Benefit Rate per Hour: $70.56
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician "A" (Swing Shift Overtime after 7.5 hours)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $109.13
Supplemental Benefit Rate per Hour: $72.91
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician "A" (Graveyard Shift)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $81.49
Supplemental Benefit Rate per Hour: $77.61
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician "A" (Graveyard Shift Overtime after 7 hours)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $122.24
Supplemental Benefit Rate per Hour: $80.23
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

*** Supplemental Benefit Rate per Hour Note**
In addition to the Supplemental Benefit Rates per Hour listed above, the employer must provide an additional 6.2% of taxable gross pay earned on covered work only. This additional Supplemental Benefit Rate will terminate when the employee has contributed the maximum annual Social Security tax required by law, on all work performed.

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on a holiday.
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
For multiple shifts of temporary light and/or power, the temporary light and/or power employee shall be paid for 8 hours at the straight time rate. For three or less workers performing 8 hours temporary light and/or power the supplemental benefit rate is $24.36, effective 04/13/2023 the supplemental benefit rate is $24.78 - See * Supplemental Benefit Rate per Hour Note above.

Electrician "M" (First 8 hours)

"M" rated work shall be defined as jobbing: electrical work of limited duration and scope, also consisting of repairs and/or replacement of electrical and tele-data equipment. Includes all work necessary to retrofit, service, maintain and repair all kinds of lighting fixtures and local lighting controls and washing and cleaning of foregoing fixtures.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $32.00
Supplemental Benefit Rate per Hour: $27.20
First and Second Year "M" Wage Rate Per Hour: $27.50
First and Second Year "M" Supplemental Rate: $24.79

Electrician "M" (Overtime After First 8 hours)

"M" rated work shall be defined as jobbing: electrical work of limited duration and scope, also consisting of repairs and/or replacement of electrical and tele-data equipment. Includes all work necessary to retrofit, service, maintain and repair all kinds of lighting fixtures and local lighting controls and washing and cleaning of foregoing fixtures.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $48.00
Supplemental Benefit Rate per Hour: $29.23
First and Second Year "M" Wage Rate Per Hour: $41.25
First and Second Year "M" Supplemental Rate: $26.52

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(Local #3)

ELECTRICIAN - ALARM TECHNICIAN
(Scope of Work - Inspect, test, repair, and replace defective, malfunctioning, or broken devices, components and controls of Fire, Burglar and Security Systems)

Alarm Technician

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $37.40

Supplemental Benefit Rate per Hour: $21.44
Supplemental Note: $19.31 only after 8 hours worked in a day

Overtime Description

Time and one half the regular rate for work on the following holidays: Columbus Day, Veterans Day, Day after Thanksgiving.
Double time the regular rate for work on the following holidays: New Year's day, Martin Luther King Jr. Day, President's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day.

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

Night Differential is based upon a ten percent (10%) differential between the hours of 4:00 P.M. and 12:30 A.M. and a fifteen percent (15%) differential for the hours 12:00 A.M. to 8:30 A.M.

Vacation

At least 1 year of employment.....ten (10) days
5 years or more of employment.....fifteen (15) days
10 years of employment.....twenty (20) days
Plus one Personal Day per year

Sick Days:
One day per Year. Up to 4 vacation days may be used as sick days.

(Local #3)

ELECTRICIAN-STREET LIGHTING WORKER

Electrician - Electro Pole Electrician

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $62.00

Supplemental Benefit Rate per Hour: $62.85
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician - Electro Pole Foundation Installer

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $47.66
Supplemental Benefit Rate per Hour: $48.72
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

Electrician - Electro Pole Maintainer

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $41.61
Supplemental Benefit Rate per Hour: $44.45
*** Supplemental Note: See Supplemental Benefit Rate per Hour Note below**

*** Supplemental Benefit Rate per Hour Note**
In addition to the Supplemental Benefit Rates per Hour listed above, the employer must provide an additional 6.2% of taxable gross pay earned on covered work only. This additional Supplemental Benefit Rate will terminate when the employee has contributed the maximum annual Social Security tax required by law, on all work performed.

Overtime Description

Electrician - Electro Pole Electrician: Time and one half the regular rate after a 7 hour day and after 5 consecutive days worked per week.
Electrician - Electro Pole Foundation Installer: Time and one half the regular rate after 8 hours within a 24 hour period and Saturday and Sunday.
Electrician - Electro Pole Maintainer: Time and one half the regular rate after a 7 hour day and after 5 consecutive days worked per week. Saturdays and Sundays may be used as a make-up day at straight time when a day is lost during the week to inclement weather.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

(Local #3)

ELEVATOR CONSTRUCTOR

Elevator Constructor

Effective Period: 7/1/2024 - 3/16/2025
Wage Rate per Hour: $80.35
Supplemental Benefit Rate per Hour: $41.23

Effective Period: 3/17/2025 - 6/30/2025
Wage Rate per Hour: $83.27
Supplemental Benefit Rate per Hour: $42.33

Overtime Description

For New Construction: work performed after an 8 hour day, Saturday, Sunday or between 4:30pm and 7:00am shall be paid at double time rate.

Existing buildings: work performed after an 8 hour day, Saturday, Sunday or between 5:30pm and 7:00 am shall be paid time and one half.

Overtime

Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Vacation

Employer contributes 8% of regular basic hourly rate as vacation pay for employees with more than 15 years of service, and 6% for employees with 5 to 15 years of service, and 4% for employees with less than 5 years of service.

(Local #1)

ELEVATOR REPAIR & MAINTENANCE

Elevator Service/Modernization Mechanic

Effective Period: 7/1/2024 - 3/16/2025
Wage Rate per Hour: $63.16
Supplemental Benefit Rate per Hour: $41.18

Effective Period: 3/17/2025 - 6/30/2025
Wage Rate per Hour: $65.54
Supplemental Benefit Rate per Hour: $42.28

Overtime Description
For Scheduled Service Work: Double time - work scheduled in advance by two or more workers performed on Sundays, Holidays, and between midnight and 7:00am.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.
Time and one half the regular rate for work on a holiday plus the day's pay.

Paid Holidays
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates
Afternoon shift - regularly hourly rate plus a (15%) fifteen percent differential. Graveyard shift - time and one half the regular rate.

Vacation
Employer contributes 8% of regular basic hourly rate as vacation pay for employees with more than 15 years of service, and 6% for employees with 5 to 15 years of service, and 4% for employees with less than 5 years of service.

(Local #1)

ENGINEER

Engineer - Heavy Construction Operating Engineer I

Cherrypickers 20 tons and over and Loaders (rubber tired and/or tractor type with a manufacturer's minimum rated capacity of six cubic yards and over).

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $76.57
Supplemental Benefit Rate per Hour: $48.85
Supplemental Note: $90.30 on overtime
Shift Wage Rate: $122.51

Engineer - Heavy Construction Operating Engineer II

Backhoes, Basin Machines, Groover, Mechanical Sweepers, Bobcat, Boom Truck, Barrier Transport (Barrier Mover) & machines of similar nature. Operation of Churn Drills and machines of a similar nature, Stetco Silent Hoist and machines of similar nature, Vac-Alls, Meyers Machines, John Beam and machines of a similar nature, Ross Carriers and Travel Lifts and machines of a similar nature, Bulldozers, Scrapers and Turn-a-Pulls: Tugger Hoists (Used exclusively for handling excavated material); Tractors with attachments, Hyster and Roustabout Cranes, Cherrypickers. Austin Western, Grove and machines of a similar nature, Scoopmobiles, Monorails, Conveyors, Trenchers: Loaders-Rubber Tired and Tractor: Barber Greene and Eimco Loaders and Eimco Backhoes; Mighty Midget and similar breakers and Tampers, Curb and Gutter Pavers and Motor Patrol, Motor Graders and all machines of a similar nature. Locomotives 10 Tons or under. Mini-Max, Break-Tech and machines of a similar nature; Milling machines, robotic and demolition machines and machines of a similar nature, shot blaster, skid steer machines and machines of a similar nature including bobcat, pile rig rubber-tired excavator (37,000 lbs. and under), 2 person auger.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $74.14
Supplemental Benefit Rate per Hour: $48.85
Supplemental Note: $90.30 on overtime
Shift Wage Rate: $118.62

Engineer - Heavy Construction Operating Engineer III

Minor Equipment such as Tractors, Post Hole Diggers, Ditch Witch (Walk Behind), Road Finishing Machines, Rollers five tons and under, Tugger Hoists, Dual Purpose Trucks, Fork Lifts, and Dempsey Dumpers, Fireperson.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $70.09
Supplemental Benefit Rate per Hour: $48.85
Supplemental Note: $90.30 on overtime
Shift Wage Rate: $112.14

Engineer - Heavy Construction Maintenance Engineer I

Installing, Repairing, Maintaining, Dismantling of all equipment including Steel Cutting, Bending and Heat Sealing Machines, Mechanical Heaters, Grout Pumps, Bentonite Pumps & Plants, Screening Machines, Fusion Coupling Machines, Tunnel Boring Machines Moles and Machines of a similar nature, Power Packs, Mechanical

Hydraulic Jacks; all drill rigs including but not limited to Churn, Rotary Caisson, Raised Bore & Drills of a similar nature; Personnel, Inspection & Safety Boats or any boats used to perform functions of same, Mine Hoists, Whirlies, all Climbing Cranes, all Tower Cranes, including but not limited to Truck Mounted and Crawler Type and machines of similar nature; Maintaining Hydraulic Drills and machines of a similar nature; Well Point System-Installation and dismantling; Burning, Welding, all Pumps regardless of size and/or motor power, except River Cofferdam Pumps and Wells Point Pumps; Motorized Buggies (three or more); equipment used in the cleaning and televising of sewers, but not limited to jet-rodder/vacuum truck, vacall/vactor, closed circuit television inspection equipment; high powered water pumps, jet pumps; screed machines and concrete finishing machines of a similar nature; vermeers.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $73.76
Supplemental Benefit Rate per Hour: $48.85
Supplemental Note: $90.30 on overtime
Shift Wage Rate: $118.02

Engineer - Heavy Construction Maintenance Engineer II

On Base Mounted Tower Cranes

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $98.47
Supplemental Benefit Rate per Hour: $48.85
Supplemental Note: $90.30 on overtime
Shift Wage Rate: $157.55

Engineer - Heavy Construction Maintenance Engineer III

On Generators, Light Towers

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $46.95
Supplemental Benefit Rate per Hour: $48.85
Supplemental Note: $90.30 on overtime
Shift Wage Rate: $75.12

Engineer - Heavy Construction Maintenance Engineer IV

On Pumps and Mixers including mud sucking

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $48.29
Supplemental Benefit Rate per Hour: $48.85
Supplemental Note: $90.30 on overtime
Shift Wage Rate: $77.26

Engineer - Heavy Construction Service Engineer

Gradalls: Concrete Pumps: Power Houses: Driving Truck Cranes: Driving and Operating Fuel and Grease Trucks.

Effective Period: 7/1/2024 - 6/30/2025

Wage Rate per Hour: $65.99
Supplemental Benefit Rate per Hour: $48.85
Supplemental Note: $90.30 on overtime
Shift Wage Rate: $105.58

Engineer - Heavy Construction Service Mechanic

Shovels: Cranes: Draglines: Backhoes: Keystones: Pavers: Trenching Machines: Gunite Machines: Compressors (three (3) or more in Battery): Crawler Cranes- having a straight lattice boom with no attachment or luffing boom, no jib and no auxiliary attachment.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $44.09
Supplemental Benefit Rate per Hour: $48.85
Supplemental Note: $90.30 on overtime
Shift Wage Rate: $70.54

Engineer - Steel Erection Maintenance Engineers

Derrick, Travelers, Tower, Crawler Tower and Climbing Cranes

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $70.95
Supplemental Benefit Rate per Hour: $48.85
Supplemental Note: $90.30 on overtime
Shift Wage Rate: $113.52

Engineer - Steel Erection Oiler I

On a Truck Crane

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $66.10
Supplemental Benefit Rate per Hour: $48.85
Supplemental Note: $90.30 on overtime
Shift Wage Rate: $105.76

Engineer - Steel Erection Oiler II

On a Crawler Crane

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $47.74
Supplemental Benefit Rate per Hour: $48.85
Supplemental Note: $90.30 on overtime
Shift Wage Rate: $76.38

Overtime Description

On jobs of more than one shift, if the next shift employee fails to report for work through any cause over which the employer has no control, the employee on duty who works the next shift continues to work at the single time rate.

Overtime

Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.
Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Engineer - Building Work Maintenance Engineers I

Installing, repairing, maintaining, dismantling (of all equipment including: Steel Cutting and Bending Machines, Mechanical Heaters, Mine Hoists, Climbing Cranes, Tower Cranes, Linden Peine, Lorain, Liebherr, Mannes, or machines of a similar nature, Well Point Systems, Deep Well Pumps, Concrete Mixers with loading Device, Concrete Plants, Motor Generators when used for temporary power and lights), skid steer machines of a similar nature including bobcat.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $62.34
Supplemental Benefit Rate per Hour: $47.94
Supplemental Note: $88.48 on overtime

Engineer - Building Work Maintenance Engineers II

On Pumps, Generators, Mixers and Heaters

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $47.29
Supplemental Benefit Rate per Hour: $47.94
Supplemental Note: $88.48 on overtime

Engineer - Building Work Oilers I

All gasoline, electric, diesel or air operated Gradealls: Concrete Pumps, Overhead Cranes in Power Houses: Their duties shall be to assist the Engineer in oiling, greasing and repairing of all machines; Driving Truck

Cranes: Driving and Operating Fuel and Grease Trucks, Cherrypickers (hydraulic cranes) over 70,000 GVW, and machines of a similar nature.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $59.02
Supplemental Benefit Rate per Hour: $47.94
Supplemental Note: $88.48 on overtime

Engineer - Building Work Oilers II

Oilers on Crawler Cranes, Backhoes, Trenching Machines, Gunite Machines, Compressors (three or more in Battery).

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $42.55
Supplemental Benefit Rate per Hour: $47.94
Supplemental Note: $88.48 on overtime

Overtime Description
On jobs of more than one shift, if an Employee fails to report for work through any cause over which the Employer has no control, the Employee on duty will continue to work at the rate of single time.

Overtime
Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.
Double time the regular rate for work on the following holiday(s).

Paid Holidays
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day

Shift Rates
When two (2) or more shifts are employed, single time will be paid for each shift.

(Local #15)

ENGINEER - CITY SURVEYOR AND CONSULTANT

Party Chief

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $44.73
Supplemental Benefit Rate per Hour: $28.36
Supplemental Note: Overtime Benefit Rate - $33.87 per hour (time & one half) $39.37 per hour (double time).

Instrument Person

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $36.30
Supplemental Benefit Rate per Hour: $28.36
Supplemental Note: Overtime Benefit Rate - $33.87 per hour (time & one half) $39.37 per hour (double time).

Rodperson

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $30.97
Supplemental Benefit Rate per Hour: $28.36
Supplemental Note: Overtime Benefit Rate - $33.87 per hour (time & one half) $39.37 per hour (double time).

Rodperson 1st Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $25.00
Supplemental Benefit Rate per Hour: $28.36
Supplemental Note: Overtime Benefit Rate - $33.87 per hour (time & one half) $39.37 per hour (double time).

Overtime Description

Time and one half the regular rate after an 8 hour day, Time and one half the regular rate for Saturday for the first eight hours worked, Double time the regular time rate for Saturday for work performed in excess of eight hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays

New Year's Day
Lincoln's Birthday
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - FIELD (BUILDING CONSTRUCTION)

(Construction of Building Projects, Concrete Superstructures, etc.)

Field Engineer - BC Party Chief

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $68.86
Supplemental Benefit Rate per Hour: $43.03
Supplemental Note: Overtime Benefit Rate - $60.85 per hour (time & one half) $78.66 per hour (double time).

Field Engineer - BC Instrument Person

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $50.03
Supplemental Benefit Rate per Hour: $43.03
Supplemental Note: Overtime Benefit Rate - $60.85 per hour (time & one half) $78.66 per hour (double time).

Field Engineer - BC Rodperson

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $30.96
Supplemental Benefit Rate per Hour: $43.03
Supplemental Note: Overtime Benefit Rate - $60.85 per hour (time & one half) $78.66 per hour (double time).

Overtime Description

Time and one half the regular rate after a 7 hour work and time and one half the regular rate for Saturday for the first seven hours worked, Double time the regular time rate for Saturday for work performed in excess of seven hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays

New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - FIELD (HEAVY CONSTRUCTION)

(Construction of Roads, Tunnels, Bridges, Sewers, Building Foundations, Engineering Structures etc.)

Field Engineer - HC Party Chief

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $79.02
Supplemental Benefit Rate per Hour: $46.67
Supplemental Note: Overtime benefit rate - $66.19 per hour (time & one half), $85.70 per hour (double time).

Field Engineer - HC Instrument Person

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $56.62
Supplemental Benefit Rate per Hour: $46.67
Supplemental Note: Overtime benefit rate - $66.19 per hour (time & one half), $85.70 per hour (double time).

Field Engineer - HC Rodperson

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $46.66
Supplemental Benefit Rate per Hour: $46.67
Supplemental Note: Overtime benefit rate - $66.19 per hour (time & one half), $85.70 per hour (double time).

Field Engineer - HC Rodperson 1st Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $25.00
Supplemental Benefit Rate per Hour: $46.67
Supplemental Note: Overtime benefit rate - $66.19 per hour (time & one half), $85.70 per hour (double time).

Overtime Description

Time and one half the regular rate after an 8 hour day, Time and one half the regular rate for Saturday for the first eight hours worked, Double time the regular time rate for Saturday for work performed in excess of eight hours, Double time the regular rate for Sunday and Double time the regular rate for work on a holiday.

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day

Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - FIELD (STEEL ERECTION)

Field Engineer - Steel Erection Party Chief

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $74.95
Supplemental Benefit Rate per Hour: $45.01
Supplemental Note: Overtime benefit rate - $63.69 per hour (time & one half), $82.37 per hour (double time).

Field Engineer - Steel Erection Instrument Person

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $56.03
Supplemental Benefit Rate per Hour: $45.01
Supplemental Note: Overtime benefit rate - $63.69 per hour (time & one half), $82.37 per hour (double time).

Field Engineer - Steel Erection Rodperson

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $36.15
Supplemental Benefit Rate per Hour: $45.01
Supplemental Note: Overtime benefit rate - $63.69 per hour (time & one half), $82.37 per hour (double time).

Field Engineer - Steel Erection Rodperson 1st Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $25.00
Supplemental Benefit Rate per Hour: $45.01
Supplemental Note: Overtime benefit rate - $63.69 per hour (time & one half), $82.37 per hour (double time).

Overtime Description

Time and one half the regular rate for Saturday for the first eight hours worked.
Double time the regular rate for Saturday for work performed in excess of eight hours.

Overtime

Time and one half the regular rate after an 8 hour day.
Double time the regular rate for Sunday.
Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
Lincoln's Birthday
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Operating Engineer Local #15-D)

ENGINEER - OPERATING

Operating Engineer - Road & Heavy Construction I

Back Filling Machines, Cranes, Mucking Machines and Dual Drum Paver.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $92.72
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $148.35

Operating Engineer - Road & Heavy Construction II

Backhoes, Power Shovels, Hydraulic Clam Shells, Steel Erection, Moles and machines of a similar nature.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $95.96
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $153.54

Operating Engineer - Road & Heavy Construction III

Mine Hoists (Cranes, etc. when used as Mine Hoists)

Effective Period: 7/1/2024 - 6/30/2025

Wage Rate per Hour: $99.01
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $158.42

Operating Engineer - Road & Heavy Construction IV

Gradealls, Keystones, Cranes on land or water (with digging buckets), Bridge Cranes, Vermeer Cutter and machines of a similar nature, Trenching Machines.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $96.64
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $154.62

Operating Engineer - Road & Heavy Construction V

Pile Drivers & Rigs (working alongside Dock Builder foreperson): Derrick Boats, Tunnel Shovels.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $94.76
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $151.62

Operating Engineer - Road & Heavy Construction VI

Mixers (Concrete with loading attachment), Concrete Pavers, Cableways, Land Derricks, Power Houses (Low Air Pressure Units).

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $90.08
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $144.13

Operating Engineer - Road & Heavy Construction VII

Barrier Movers, Barrier Transport and Machines of a Similar Nature.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $73.00
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $116.80

Operating Engineer - Road & Heavy Construction VIII

Utility Compressors

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $56.95
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $71.45

Operating Engineer - Road & Heavy Construction IX

Horizontal Boring Rig

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $85.75
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $137.20

Operating Engineer - Road & Heavy Construction X

Elevators (manually operated as personnel hoist).

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $78.92
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $126.27

Operating Engineer - Road & Heavy Construction XI

Compressors (Portable 3 or more in battery), Driving of Truck Mounted Compressors, Well-point Pumps, Tugger Machines Well Point Pumps, Churn Drill.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $61.57
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $98.51

Operating Engineer - Road & Heavy Construction XII

All Drills and Machines of a similar nature.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $91.03
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $145.65

Operating Engineer - Road & Heavy Construction XIII

Concrete Pumps, Concrete Plant, Stone Crushers, Double Drum Hoist, Power Houses (other than above).

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $88.22
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $141.15

Operating Engineer - Road & Heavy Construction XIV

Concrete Mixer

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $84.38
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $135.01

Operating Engineer - Road & Heavy Construction XV

Compressors (Portable Single or two in Battery, not over 100 feet apart), Pumps (River Cofferdam) and Welding Machines, Push Button Machines, All Engines Irrespective of Power (Power-Pac) used to drive auxiliary equipment, Air, Hydraulic, etc.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $57.32
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $91.71

Operating Engineer - Road & Heavy Construction XVI

Concrete Breaking Machines, Hoists (Single Drum), Load Masters, Locomotives (over ten tons) and Dinkies over ten tons, Hydraulic Crane-Second Engineer.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $80.64
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $129.02

Operating Engineer - Road & Heavy Construction XVII

On-Site concrete plant engineer, On-site Asphalt Plant Engineer, and Vibratory console.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $81.22
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours

Shift Wage Rate: $129.95

Operating Engineer - Road & Heavy Construction XVIII

Tower Crane

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $116.04
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $185.66

Operating Engineer - Paving I

Asphalt Spreaders, Autograde (C.M.I.), Roto/Mil

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $90.08
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $144.13

Operating Engineer - Paving II

Asphalt Roller

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $87.81
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $140.50

Operating Engineer - Paving III

Asphalt Plants

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $74.42
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $119.07

Operating Engineer - Concrete I

Cranes

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $96.22
Supplemental Benefit Rate per Hour: $36.90

Supplemental Note: $67.50 overtime hours

Operating Engineer - Concrete II

Compressors

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $57.75
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours

Operating Engineer - Concrete III

Micro-traps (Negative Air Machines), Vac-All Remediation System.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $77.14
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours

Operating Engineer - Steel Erection I

Three Drum Derricks

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $100.14
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $160.22

Operating Engineer - Steel Erection II

Cranes, 2 Drum Derricks, Hydraulic Cranes, Fork Lifts and Boom Trucks.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $96.26
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $154.02

Operating Engineer - Steel Erection III

Compressors, Welding Machines.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $56.34
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $90.14

Operating Engineer - Steel Erection IV

Compressors - Not Combined with Welding Machine. (Public Works Only)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $53.69
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
Shift Wage Rate: $85.90

Operating Engineer - Building Work I

Forklifts, Plaster (Platform machine), Plaster Bucket, Concrete Pump and all other equipment used for hoisting material.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $73.52
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours

Operating Engineer - Building Work II

Compressors, Welding Machines (Cutting Concrete-Tank Work), Paint Spraying, Sandblasting, Pumps (with the exclusion of Concrete Pumps), All Engines irrespective of Power (Power-Pac) used to drive Auxiliary Equipment, Air, Hydraulic, Jacking System, etc.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $55.18
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours

Operating Engineer - Building Work III

Double Drum

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $91.26
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours

Operating Engineer - Building Work IV

Stone Derrick, Cranes, Hydraulic Cranes Boom Trucks.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $96.60
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours

Operating Engineer - Building Work V

Dismantling and Erection of Cranes, Relief Engineer.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $81.62
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours

Operating Engineer - Building Work VI

4 Pole Hoist, Single Drum Hoists.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $80.76
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours

Operating Engineer - Building Work VII

Rack & Pinion and House Cars

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $64.33
Supplemental Benefit Rate per Hour: $36.90
Supplemental Note: $67.50 overtime hours
For New House Car projects Wage Rate per Hour $51.45
For New House Car projects: Supplemental Benefit overtime hours: $52.20

Overtime Description

On jobs of more than one shift, if an Employee fails to report for work through any cause over which the Employer has no control, the Employee on duty will continue to work at the rate of single time.

For House Cars and Rack & Pinion only: Overtime paid at time and one-half for all hours in excess of eight hours in a day, Saturday, Sunday and Holidays worked.

Overtime

Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.
Double time the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving

Christmas Day

Shift Rates

When two (2) or more shifts are employed, single time will be paid for each shift.
For Steel Erection Only: Shifts may be worked at the single time rate at other than the regular working hours (8:00 A.M. to 4:30 P.M.) on the following work ONLY: Heavy construction jobs on work below the street level, over railroad tracks and on building jobs.

(Operating Engineer Local #14)

FLAGGER

Flagger to be paid at the rate of the journeyperson or apprentice in the trade performing the underlying work.

In accordance with the Comptroller's Prevailing Wage Memorandum Regarding Flag Persons dated June 1, 2024, this title includes traffic control duty only for City public works contracts and subcontracts solicited on or after July 1, 2024.

On City public works contracts and subcontracts solicited on or after July 1, 2024, traffic control worker to be paid at the rate of the journeyperson or apprentice in the trade performing the underlying work.

If the trade performing the underlying work does not regularly employ a flagger or traffic control worker, then one of the following titles must be used on such projects:
Laborer - Heavy & Highway
Laborer - Paver & Roadbuilder
Laborer - Paver & Roadbuilder Line Striping (Roadway)

FLOOR COVERER

(Interior vinyl composition tile, sheath vinyl linoleum and wood parquet tile including site preparation and synthetic turf not including site preparation)

Floor Coverer

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $55.05
Supplemental Benefit Rate per Hour: $47.88

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $57.05
Supplemental Benefit Rate per Hour: $48.33

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Day after Thanksgiving
Day before Christmas
Christmas Day
Day before New Year's Day

Shift Rates

Two shifts may be utilized with the first shift working 8 a.m. to the end of the shift at straight time rate of pay. The wage rate for the second shift consisting of 7 hours shall be paid at 114.29% of straight time wage rate. The wage rate for the second shift consisting of 8 hours shall be paid 112.5% of the straight time wage rate. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants, the rule for the second shift will apply.

(Carpenters District Council)

GLAZIER

(New Construction, Remodeling, and Alteration)

Glazier

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $49.00
Supplemental Benefit Rate per Hour: $55.77

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(Local #1281)

GLAZIER - REPAIR & MAINTENANCE
(For the Installation of Glass - All repair and maintenance work on a particular building.)

Craft Jurisdiction for repair, maintenance and fabrication

Plate glass replacement, Storm windows and storm doors, Herculite door repairs, Door closer repairs, Glass tinting.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $27.45
Supplemental Benefit Rate per Hour: $27.93

Overtime
Time and one half the regular rate after an 8 hour day.
Double time the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).
Time and one half the regular hourly rate after 40 straight time hours in any work week.

Paid Holidays
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day
Employees must work at least one day in the payroll week in which the holiday occurs to receive the paid holiday

(Local #1281)

HAZARDOUS MATERIAL HANDLER
(Removal, abatement, encapsulation or decontamination of asbestos, lead, mold, or other toxic or hazardous waste/materials)

Handler

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $39.00
Supplemental Benefit Rate per Hour: $21.65

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $39.20
Supplemental Benefit Rate per Hour: $22.90

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Sunday.
Time and one half the regular hourly rate after 40 straight time hours in any work week.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day
Easter

Paid Holidays
None

(Local #78 and Local #12A)

HEAT AND FROST INSULATOR

Heat & Frost Insulator

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $70.96
Supplemental Benefit Rate per Hour: $36.06

Overtime Description
Supplemental Benefit contributions are to be made at the applicable overtime rates.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Triple time the regular rate for work on the following holiday(s).
Labor Day

Paid Holidays
None

Shift Rates
The first shift shall work seven hours at the regular straight time rate. The second and third shift shall work seven hours the regular straight time hourly rate plus a fourteen percent wage and benefit premium. There must be a first shift to work the second shift, and a second shift to work the third shift. Off-hour jobs in occupied buildings may be worked on weekdays with an increment of one-dollar ($1.00) per hour and eight (8) hours pay for seven (7) hours worked.

(Local #12) (BCA)

HOUSE WRECKER
(TOTAL DEMOLITION)

House Wrecker - Tier A

On all work sites the first, second, eleventh and every third House Wrecker thereafter will be Tier A House Wreckers (i.e. 1st, 2nd, 11th, 14th etc). Other House Wreckers may be Tier B House Wreckers.

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $39.48
Supplemental Benefit Rate per Hour: $31.92

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $39.61
Supplemental Benefit Rate per Hour: $32.29

House Wrecker - Tier B

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $28.71
Supplemental Benefit Rate per Hour: $24.33

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $28.84
Supplemental Benefit Rate per Hour: $24.70

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

(Mason Tenders District Council)

IRON WORKER - ORNAMENTAL

Iron Worker - Ornamental

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $47.65
Supplemental Benefit Rate per Hour: $65.75
Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $47.90
Supplemental Benefit Rate per Hour: $66.74
Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

Overtime Description
Monday through Friday- the first eight hours are paid at straight time, the 9th and 10th hours are paid at time and one-half the regular rate, all additional weekday overtime is paid at double the regular rate. Saturdays- the first eight hours are paid at time and one-half the regular rate, double time thereafter. Sunday-all shifts are paid at double time. Four Days a week at Ten (10) hours straight time is allowed.

Overtime
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
When two or three shifts are employed on a job, Monday through Friday, each shift will be paid eight (8) hours at the straight time rate for eight (8) hours of work; at time and one-half the regular straight time rate for the first two (2) hours of overtime worked beyond eight (8) hours; and at double time for all work thereafter. When it is not possible to conduct alteration or repair work during regular working hours in a building occupied by tenants,

eight (8) hours will be paid at straight time rate for seven (7) hours of work, and all overtime shall be paid at time and one-half the regular straight time rates. On Saturday, Sundays and Holidays, time and one-half the regular straight time rate shall be paid for all work up to seven (7) hours and double time shall be paid for all work thereafter.

(Local #580)

IRON WORKER - STRUCTURAL

Iron Worker - Structural

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $58.20
Supplemental Benefit Rate per Hour: $89.27
Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $58.45
Supplemental Benefit Rate per Hour: $90.77
Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

Overtime Description
Monday through Friday- the first eight hours are paid at straight time, the 9th and 10th hours are paid at time and one-half the regular rate, all additional weekday overtime is paid at double the regular rate. Saturdays- the first eight hours are paid at time and one-half the regular rate, double time thereafter. Sunday-all shifts are paid at double time. Four Days a week at Ten (10) hours straight time is allowed.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day on Christmas Eve if work is performed in the A.M.

1/2 day on New Year's Eve if work is performed in the A.M.

Shift Rates

Monday through Friday - First Shift: First eight hours are paid at straight time, the 9th & 10th hours are paid at time and a half, double time paid thereafter. Second and third Shifts: First eight hours are paid at time and one-half, double time thereafter. Saturdays: All shifts, first eight hours paid at time and one-half, double time thereafter: Sunday all shifts are paid at double time.

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday.

(Local #40 & #361)

LABORER

see LABORER – HEAVY & HIGHWAY

LABORER – HEAVY & HIGHWAY

(Foundation, Concrete, Excavating, Street Pipe Layer and Common)

Laborer - Heavy & Highway

Excavation and foundation work for buildings, heavy construction, street pipe laying, engineering work, and hazardous waste removal in connection with the above work. Landscaping tasks in connection with heavy construction work, engineering work and building projects. Projects include, but are not limited to pollution plants, sewers, parks, subways, bridges, highways, etc. In accordance with the Comptroller's Prevailing Wage Memorandum Regarding Flag Persons dated June 1, 2024, for City public work contracts and subcontracts solicited on or after July 1, 2024 only, includes traffic control duty associated with such projects.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $45.00
Supplemental Benefit Rate per Hour: $54.03

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).

New Year's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day
Christmas Day

Paid Holidays

Labor Day
Thanksgiving Day

Shift Rates

When two shifts are employed, single time rate shall be paid for each shift. When three shifts are found necessary, each shift shall work seven and one half hours (7 ½), but shall be paid for eight (8) hours of labor, and be permitted one half hour for lunch.

(Local #731)

LABORER - PAVER & ROADBUILDER

Laborer - Paver & Roadbuilder

Paving and road construction work, regardless of material used, including but not limited to preparation of job sites, removal of old surfaces, asphalt and/or concrete, by whatever method, including but not limited to milling; laying of concrete; laying of asphalt for temporary, patchwork, and utility paving (but not production paving); site preparation and incidental work for installation of rubberized materials and similar surfaces; installation and repair of temporary construction fencing; slurry/seal coating, paving stones, maintenance of safety surfaces; play equipment installation, and other related work. In accordance with the Comptroller's Prevailing Wage Memorandum Regarding Flag Persons dated June 1, 2024, for City public work contracts and subcontracts solicited on or after July 1, 2024 only, includes traffic control duty associated with such projects.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $45.48
Supplemental Benefit Rate per Hour: $53.55
Supplemental Note: For time and one half overtime - $58.18 For double overtime - $62.80

Paver & Roadbuilder - Formsetter

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $49.35
Supplemental Benefit Rate per Hour: $53.55
Supplemental Note: For time and one half overtime - $58.18 For double overtime - $62.80

Production Paver & Roadbuilder - Shoveler

General laborer (except removal of surfaces - see Paver and Roadbuilder-Laborer) including but not limited to tamper, AC paint and liquid tar work.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $45.48
Supplemental Benefit Rate per Hour: $53.55
Supplemental Note: For time and one half overtime - $58.18 For double overtime - $62.80

Production Paver & Roadbuilder - Raker

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $49.35
Supplemental Benefit Rate per Hour: $53.55
Supplemental Note: For time and one half overtime - $58.18 For double overtime - $62.80

Production Paver & Roadbuilder - Screed Person

(Production paving is asphalt paving when using a paving machine or on a project where a paving machine is traditionally used)

Adjustment of paving machinery on production paving jobs.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $49.95
Supplemental Benefit Rate per Hour: $53.55
Supplemental Note: For time and one half overtime - $58.18 For double overtime - $62.80

Overtime Description

If an employee works New Year's Day or Christmas Day, they receive the single time rate plus 25%.

For Paid Holidays: Holiday pay for all holidays shall be prorated based two hours per day for each day worked in the holiday week, not to exceed 8 hours of holiday pay.

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day

Paid Holidays

Memorial Day
Independence Day
Labor Day
Thanksgiving Day

Shift Rates

When two shifts are employed, the work period for each shift shall be a continuous eight (8) hours. When three shifts are employed, each shift will work seven and one half (7 ½) hours but will be paid for eight (8) hours at the straight time rate since only one half (1/2) hour is allowed for meal time.
When two or more shifts are employed, single time will be paid for each shift.

(Local #1010)

LABORER - PAVER & ROADBUILDER LINE STRIPING (ROADWAY)

(Road markings, applications of striping and surface coatings on Roadways, Bus lanes, Bike lanes & Pedestrian Plazas)

Striping - Machine Operator (Thermoplastic & Epoxy)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $41.00
Supplemental Benefit Rate per Hour: $19.27
Supplemental Note: For time and one half overtime - $20.52 For double overtime - $21.77

Lineperson - Crew Chief

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $45.00
Supplemental Benefit Rate per Hour: $19.27
Supplemental Note: For time and one half overtime - $20.52 For double overtime - $21.77

Laborer: Striping Assistant - Green Infrastructure - Traffic Control

In accordance with the Comptroller's Prevailing Wage Memorandum Regarding Flag Persons dated June 1, 2024, for City public work contracts and subcontracts solicited on or after July 1, 2024 only, includes traffic control duty associated with such projects.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $39.00
Supplemental Benefit Rate per Hour: $19.27
Supplemental Note: For time and one half overtime - $20.52 For double overtime - $21.77

Overtime Description

For Paid Holidays: Employees will only receive Holiday Pay for holidays not worked if said employee worked both the regularly scheduled workday before and after the holiday.

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Vacation

Vacation Employees with one to two years service shall accrue vacation based on hours worked: 250 hours worked - 1 day vacation; 500 hours worked - 2 days vacation; 750 hours worked - 3 days vacation; 900 hours worked - 4 days vacation; 1,000 hours worked - 5 days vacation. Employees with two to five years service receive two weeks vacation. Employees with five to twenty years service receive three weeks vacation. Employees with twenty to twenty-five years service receive four weeks vacation. Employees with 25 or more years service receive five weeks vacation.

(Local #1010)

LANDSCAPING

(Landscaping tasks, such as tree pruning, tree removing and spraying in connection with Green Infrastructure maintenance and the planting of street trees and trees in City parks, but not when such activities are performed as part of construction or reconstruction projects.)

Landscaper (Year 6 and above)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $37.77
Supplemental Benefit Rate per Hour: $18.05

Landscaper (Year 3 - 5)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $36.56
Supplemental Benefit Rate per Hour: $18.05

Landscaper (up to 3 years)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $33.55
Supplemental Benefit Rate per Hour: $18.05

Groundperson

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $33.55
Supplemental Benefit Rate per Hour: $18.05

Tree Remover / Pruner

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $43.81
Supplemental Benefit Rate per Hour: $18.05

Landscaper Sprayer (Pesticide Applicator)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $31.75
Supplemental Benefit Rate per Hour: $18.05

Watering - Plant Maintainer

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $25.69
Supplemental Benefit Rate per Hour: $18.05

Overtime Description

For all overtime work performed, supplemental benefits shall include an additional seventy-five ($0.75) cents per hour.

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Time and one half the regular rate for work on a holiday plus the day's pay.

Paid Holidays

New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Shift Rates

Work performed on a 4pm to 12am shift has a 15% differential. Work performed on a 12am to 8am shift has a 20% differential.

(Local #175)

MARBLE MECHANIC

Marble Setter

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $58.92
Supplemental Benefit Rate per Hour: $44.01

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $59.21
Supplemental Benefit Rate per Hour: $44.46

Marble Finisher

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $45.44
Supplemental Benefit Rate per Hour: $41.06

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $45.67
Supplemental Benefit Rate per Hour: $41.36

Marble Polisher

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $44.47
Supplemental Benefit Rate per Hour: $33.96

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $44.68
Supplemental Benefit Rate per Hour: $34.31

Marble Maintenance Finisher

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $27.72
Supplemental Benefit Rate per Hour: $15.31

Effective Period: 1/20/2025 - 6/30/2025

Wage Rate per Hour: $27.99
Supplemental Benefit Rate per Hour: $15.44

Overtime Description
Supplemental Benefit contributions are to be made at the applicable overtime rates.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(Local #7)

MASON TENDER
Building Laborer

Mason Tender

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $41.45
Supplemental Benefit Rate per Hour: $33.24

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $41.80
Supplemental Benefit Rate per Hour: $34.14

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays

None

Shift Rates

The employer may work two (2) shifts with the first shift at the straight time wage rate and the second shift receiving eight (8) hours paid for seven (7) hours work at the straight time wage rate. When it is not possible to conduct alteration work during regular working hours in a building occupied by tenants, the rule for the second shift will apply

(Local #79)

MASON TENDER (INTERIOR DEMOLITION WORKER)

Mason Tender Tier A

Tier A Interior Demolition Worker performs all burning, chopping, and other technically skilled tasks related to interior demolition work.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $38.00
Supplemental Benefit Rate per Hour: $26.54

Mason Tender Tier B

Tier B Interior Demolition Worker performs manual work and work incidental to demolition work, such as loading and carting of debris from the work site to an area where it can be loaded in to bins/trucks for removal. Also performs clean-up of the site when demolition is completed.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $27.19

Supplemental Benefit Rate per Hour: $20.86

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

(Local #79)

METALLIC LATHER

Metallic Lather

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $46.45
Supplemental Benefit Rate per Hour: $54.80
Supplemental Note: For time and one half overtime - $66.55 For double overtime - $86.60

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day on Christmas Eve if work is performed in the A.M.
1/2 day on New Year's Eve if work is performed in the A.M.

Shift Rates
Off-shift work outside of normal working hours shall receive straight time rate plus $12 per hour for the first eight (8) hours.

(Local #46)

MILLWRIGHT

Millwright

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $59.35
Supplemental Benefit Rate per Hour: $58.67

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Veteran's Day
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day on Christmas Eve if work is performed in the A.M.
1/2 day on New Year's Eve if work is performed in the A.M.

Shift Rates

Second and third shifts receives the straight time rate of pay plus fifteen (15%) percent allowing for one half hour for a meal. There must be a first shift to work a second and third shift. All additional hours worked shall be paid at the time and one-half rate of pay plus fifteen (15%) percent for weekday hours.

(Local #740)

MOSAIC MECHANIC

Mosaic Mechanic - Mosaic & Terrazzo Mechanic

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $53.98
Supplemental Benefit Rate per Hour: $47.12

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $54.33
Supplemental Benefit Rate per Hour: $47.82

Mosaic Mechanic - Mosaic & Terrazzo Finisher

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $52.37
Supplemental Benefit Rate per Hour: $47.12

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $52.72
Supplemental Benefit Rate per Hour: $47.82

Mosaic Mechanic - Machine Operator Grinder

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $52.37
Supplemental Benefit Rate per Hour: $47.12

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $52.72
Supplemental Benefit Rate per Hour: $47.82

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
Washington's Birthday
Good Friday
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

(Local #7)

PAINTER

Painter - Brush & Roller

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $44.00
Supplemental Benefit Rate per Hour: $42.46
Supplemental Note: $50.56 on overtime

Spray & Scaffold / Decorative / Sandblast

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $47.00
Supplemental Benefit Rate per Hour: $42.46
Supplemental Note: $50.56 on overtime

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day

Day after Thanksgiving
Christmas Day

Paid Holidays
None

(District Council of Painters #9)

PAINTER - BRIDGE & STRUCTURAL STEEL

Painters on Structural Steel

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $56.00
Supplemental Benefit Rate per Hour: $52.78

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $56.25
Supplemental Benefit Rate per Hour: $55.09

Painter - Power Tool

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $63.00
Supplemental Benefit Rate per Hour: $52.78
Overtime Wage Rate: $6.50 above the "Painters on Structural Steel" overtime rate.

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $64.70
Supplemental Benefit Rate per Hour: $55.09
Overtime Wage Rate: $7.00 above the "Painters on Structural Steel" overtime rate.

Overtime Description
Supplemental Benefits shall be paid for each hour worked, up to forty (40) hours per week for the period of May 1st to November 15th or up to fifty (50) hours per week for the period of November 16th to April 30th.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Memorial Day
Independence Day

Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
Second shift is paid at regular hourly wage rates plus a ten percent (10%) differential. There must be a first shift to work a second shift.

(Local #806)

PAINTER - METAL POLISHER

METAL POLISHER

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $34.00
Supplemental Benefit Rate per Hour: $12.36

METAL POLISHER - NEW CONSTRUCTION

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $34.95
Supplemental Benefit Rate per Hour: $12.36

METAL POLISHER - SCAFFOLD OVER 34 FEET

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $37.50
Supplemental Benefit Rate per Hour: $12.36

ASSISTANT METAL POLISHER

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $26.50
Supplemental Benefit Rate per Hour: $11.92

ASSISTANT METAL POLISHER - NEW CONSTRUCTION

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $27.25

Supplemental Benefit Rate per Hour: $11.92

ASSISTANT METAL POLISHER - SCAFFOLD OVER 34 FEET

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $29.00
Supplemental Benefit Rate per Hour: $11.92

Overtime Description

All work performed on Saturdays shall be paid at time-in-a half. The exception being; for suspended scaffold work and work deemed as a construction project; an eight (8) hour shift lost during the week due to circumstances beyond the control of the employer, up to a maximum of eight (8) hours per week, may be worked on Saturday at the straight time rate.

Holiday Pay
Double time the regular rate for work on the following Holiday plus the day's pay. Only employees who have completed one year of service, including any trial period shall be eligible for holiday pay.

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

Four Days a week at Ten (10) hours straight a day.

Local 8A-28A

PAINTER - SIGN

Sign Painter

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $48.07
Supplemental Benefit Rate per Hour: $27.25

Assistant Sign Painter

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $40.85
Supplemental Benefit Rate per Hour: $25.90

Overtime Description
If any employee is required to work on any of the paid holidays then the employee shall receive double time rate of wages as well as the holiday pay for that day.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Paid Holidays
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Vacation
At least 1 year of employment.....1 week
2 years or more of employment.....2 weeks
8 years or more of employment.....3 weeks

(Local #8A-28A)

PAPERHANGER

Paperhanger

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $48.02
Supplemental Benefit Rate per Hour: $43.14
Supplemental Note: Supplemental benefits are to be paid at the appropriate straight time and overtime rate.

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
Evening shift - 4:30 P.M. to 12:00 Midnight (regular rate of pay); any work performed before 7:00 A.M. shall be at time and one half the regular base rate of pay.

(District Council of Painters #9)

PAVER AND ROADBUILDER
SEE LABORER - PAVER AND ROADBUILDER

PAVER AND ROADBUILDER - LINE STRIPING (ROADWAY)
SEE LABORER - PAVER AND ROADBUILDER - LINE STRIPING (ROADWAY)

PLASTERER

Plasterer

Effective Period: 7/1/2024 - 7/31/2024
Wage Rate per Hour: $52.10
Supplemental Benefit Rate per Hour: $25.35

Effective Period: 8/1/2024 - 6/30/2025
Wage Rate per Hour: $52.99
Supplemental Benefit Rate per Hour: $26.10

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
When it is not possible to conduct work during regular working hours (between 6:30am and 4:30pm), a shift differential shall be paid at the regular hourly rate plus a twelve percent (12%) per hour differential. Workers on shift work shall be allowed a paid one-half hour meal break.

(Local #262)

PLASTERER - TENDER

Plasterer - Tender

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $41.45
Supplemental Benefit Rate per Hour: $33.24

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $41.80
Supplemental Benefit Rate per Hour: $34.14

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
Washington's Birthday
Memorial Day
Independence Day
Labor Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays

None

Shift Rates

When work commences outside regular work hours, workers receive an hour additional (differential) wage and supplement payment. Eight hours pay for seven hours work or nine hours pay for eight hours work.

(Mason Tenders District Council)

PLUMBER

Plumber

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $74.95
Supplemental Benefit Rate per Hour: $43.00
Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

Plumber - Temporary Services

Temporary Services - When there are no Plumbers on the job site, there may be three shifts designed to cover the entire twenty-four hour period, including weekends if necessary, at the following rate straight time.

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $60.04
Supplemental Benefit Rate per Hour: $34.32

Overtime Description

Where the plumbing contract price is one and one half million dollars ($1,500,000.00) or less, double time the regular rate after an 8 hour day.

Overtime

Double time the regular rate after a 7 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

30% shift premium shall be paid for wages and fringe benefits for 4:00 pm and midnight shifts Monday to Friday. 50% shift premium shall be paid for wages and fringe benefits for 4:00 pm and midnight shift work performed on weekends. For shift work on holidays, double time wages and fringe benefits shall be paid.

(Plumbers Local #1)

PLUMBER (MECHNICAL EQUIPMENT AND SERVICE)

(Mechanical Equipment and Service work shall include any repair and/or replacement of the present plumbing system.)

Plumber

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $48.20
Supplemental Benefit Rate per Hour: $21.36

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $48.90
Supplemental Benefit Rate per Hour: $22.26

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

(Plumbers Local # 1)

PLUMBER (RESIDENTIAL RATES FOR 1, 2 AND 3 FAMILY HOME CONSTRUCTION)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $52.07
Supplemental Benefit Rate per Hour: $30.82

Overtime

Double time the regular rate after an 8 hour day.
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

Shift Rates

30% shift premium shall be paid for wages and fringe benefits for 4:00 pm and midnight shifts Monday to Friday. 50% shift premium shall be paid for wages and fringe benefits for 4:00 pm and midnight shift work performed on weekends. For shift work on holidays, double time wages and fringe benefits shall be paid.

(Plumbers Local #1)

PLUMBER: PUMP & TANK

Oil Trades (Installation and Maintenance)

Plumber - Pump & Tank

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $73.00
Supplemental Benefit Rate per Hour: $32.81

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

None

Shift Rates

All work outside the regular workday (8:00 A.M. to 3:30 P.M.) is to be paid at time and one half the regular hourly rate

(Plumbers Local #1)

POINTER, WATERPROOFER, CAULKER, SANDBLASTER, STEAMBLASTER

(Exterior Building Renovation)

Journeyperson

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $63.43
Supplemental Benefit Rate per Hour: $31.50

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays

None

Shift Rates

All work outside the regular work day (an eight hour workday between the hours of 6:00 A.M. and 4:00 P.M.) is to be paid at time and one half the regular rate. However, the employer may establish one (1) or two (2) shifts starting at or after 4:00 P.M. to be paid at the regular hourly rate plus a 10% differential. For projects bid and performed after July 1, 2023, the first shift shall be paid at the regular hourly rate plus a 5% differential.

(Bricklayer District Council)

ROOFER

Roofer

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $48.50
Supplemental Benefit Rate per Hour: $38.81

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

Shift Rates
Second shift - Regular hourly rate plus a 10% differential. Third shift - Regular hourly rate plus a 15% differential. There must be a first shift to work the second shift, and a second shift to work the third shift. All other work outside the regular work day (an eight hour workday between the hours of 5:00 A.M. and 4:00 P.M.) is to be paid at time and one half the regular rate.

(Local #8)

SHEET METAL WORKER

Sheet Metal Worker

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $53.60
Supplemental Benefit Rate per Hour: $58.43
Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $54.60
Supplemental Benefit Rate per Hour: $60.18

Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

Sheet Metal Worker - Fan Maintenance

(The temporary operation of fans or blowers in new or existing buildings for heating and/or ventilation, and/or air conditioning prior to the completion of the project.)

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $42.88
Supplemental Benefit Rate per Hour: $58.43

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $43.68
Supplemental Benefit Rate per Hour: $60.18

Sheet Metal Worker - Duct Cleaner

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $19.57
Supplemental Benefit Rate per Hour: $12.72

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
Work that can only be performed outside regular working hours (eight hours of work between 7:30 A.M. and 3:30 P.M.) - First shift (work between 3:30 P.M. and 11:30 P.M.) - 10% differential above the established hourly rate. Second shift (work between 11:30 P.M. and 7:30 A.M.) - 15% differential above the established hourly rate.

For Fan Maintenance: On all full shifts of fan maintenance work the straight time hourly rate of pay will be paid for each shift, including nights, Saturdays, Sundays, and holidays.

(Local #28)

SHEET METAL WORKER - SPECIALTY
(Decking & Siding)

Sheet Metal Specialty Worker

The first worker to perform this work must be paid at the rate of the Sheet Metal Worker. The second and third workers shall be paid the Specialty Worker Rate. The ratio of One Sheet Metal Worker, then Two Specialty Workers shall be utilized thereafter.

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $50.10
Supplemental Benefit Rate per Hour: $30.04
Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $50.50
Supplemental Benefit Rate per Hour: $31.26
Supplemental Note: Supplemental benefit contributions are to be made at the applicable overtime rates.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day

Paid Holidays
None

(Local #28)

SHIPYARD WORKER

Shipyard Mechanic - First Class

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $31.50
Supplemental Benefit Rate per Hour: $3.98

Shipyard Mechanic - Second Class

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $23.86
Supplemental Benefit Rate per Hour: $3.77

Shipyard Laborer - First Class

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $25.85
Supplemental Benefit Rate per Hour: $3.78

Shipyard Laborer - Second Class

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $18.87
Supplemental Benefit Rate per Hour: $3.72

Shipyard Dockhand - First Class

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $24.20
Supplemental Benefit Rate per Hour: $3.77

Shipyard Dockhand - Second Class

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $19.37
Supplemental Benefit Rate per Hour: $3.63

Overtime Description

Work performed on holiday is paid double time the regular hourly wage rate plus holiday pay.

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Time and one half the regular hourly rate after 40 straight time hours in any work week.

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Based on Survey Data

SIGN ERECTOR

(Sheet Metal, Plastic, Electric, and Neon)

Sign Erector

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $58.00
Supplemental Benefit Rate per Hour: $63.44

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.
Time and one half the regular rate for work on the following holiday(s).

Paid Holidays

New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates

Time and one half the regular hourly rate is to be paid for all hours worked outside the regular workday either (7:00 A.M. through 2:30 P.M.) or (8:00 A.M. through 3:30 P.M.)

(Local #137)

STEAMFITTER

Steamfitter

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $61.80
Supplemental Benefit Rate per Hour: $61.14
Supplemental Note: Overtime supplemental benefit rate: $121.54

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $61.80
Supplemental Benefit Rate per Hour: $61.89
Supplemental Note: Overtime supplemental benefit rate: $123.04

Steamfitter -Temporary Services

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $46.97
Supplemental Benefit Rate per Hour: $49.65

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $46.97
Supplemental Benefit Rate per Hour: $50.22

Overtime Description
Double time after a 7 hour day except for Temporary Services.

Overtime
Double time the regular time rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
May be performed outside of the regular workday except Saturday, Sunday and Holidays. When shift work is performed the wage rate for regular time worked is a 15% percent premium on wage and 15% percent premium on supplemental benefits.

Local 638

STEAMFITTER - REFRIGERATION AND AIR CONDITIONER
(Maintenance and Installation Service Person)

Refrigeration and Air Conditioner Mechanic

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $46.10
Supplemental Benefit Rate per Hour: $21.96

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Independence Day
Labor Day
Veteran's Day
Thanksgiving Day
Christmas Day

Double time and one half the regular rate for work on the following holiday(s).
Martin Luther King Jr. Day
President's Day
Memorial Day
Columbus Day

Paid Holidays
New Year's Day
Martin Luther King Jr. Day

President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Christmas Day

(Local #638-B)

STONE MASON - SETTER

Stone Mason - Setter

(Assisted by Derrickperson and Rigger)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $57.35
Supplemental Benefit Rate per Hour: $55.47

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Washington's Birthday
Good Friday
Memorial Day
Independence Day
Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays
1/2 day on Christmas Eve if work is performed in the A.M.

Shift Rates
For all work outside the regular workday (8:00 A.M. to 3:30 P.M. Monday through Friday), the pay shall be straight time plus a ten percent (10%) differential.

(Bricklayers District Council)

TAPER

Drywall Taper

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $48.47
Supplemental Benefit Rate per Hour: $33.51

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $48.47
Supplemental Benefit Rate per Hour: $34.71

Overtime
Time and one half the regular rate after a 7 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
Martin Luther King Jr. Day
President's Day
Good Friday
Memorial Day
Independence Day
Columbus Day
Thanksgiving Day
Day before Christmas
Christmas Day
Day before New Year's Day

Paid Holidays
Labor Day

(Local #1974)

TELECOMMUNICATION WORKER
(Install/maintain/repair telecommunications cables carrying data, video, and/or voice except for installation on building construction/alteration/renovation projects.)

Telecommunication Worker

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $47.03
Supplemental Benefit Rate per Hour: $23.15
Supplemental Note: The above rate applies for Manhattan, Bronx, Brooklyn, Queens. $22.84 for Staten Island only.

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Time and one half the regular rate for Sunday.

Overtime Holidays
Time and one half the regular rate for work on the following holiday(s).
New Year's Day
Lincoln's Birthday
Washington's Birthday
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day

Paid Holidays
New Year's Day
Lincoln's Birthday
Washington's Birthday
Memorial Day
Independence Day
Labor Day
Columbus Day
Election Day
Veteran's Day
Thanksgiving Day
Christmas Day
Employees have the option of observing either Martin Luther King's Birthday or the day after Thanksgiving instead of Lincoln's Birthday

Shift Rates
For any workday that starts before 8A.M. or ends after 6P.M. there is a 10% differential for the applicable worker's hourly rate.

Vacation
After 6 months.....one week.
After 12 months but less than 7 years.....two weeks.
After 7 or more but less than 15 years.....three weeks.

After 15 years or more but less than 25 years.....four weeks.

(C.W.A.)

TILE FINISHER

Tile Finisher

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $49.46
Supplemental Benefit Rate per Hour: $32.86

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $49.59
Supplemental Benefit Rate per Hour: $33.31

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays
None

Shift Rates
Off shift work day (work performed outside the regular 8:00 A.M. to 3:30 P.M. workday): shift differential of one and one quarter (1¼) times the regular straight time rate of pay for the seven hours of actual off-shift work.

(Local #7)

TILE LAYER - SETTER

Tile Layer - Setter

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $64.40
Supplemental Benefit Rate per Hour: $36.01

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $64.62
Supplemental Benefit Rate per Hour: $36.51

Overtime
Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.

Overtime Holidays
Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Shift Rates
Off shift work day (work performed outside the regular 8:00 A.M. to 3:30 P.M. workday): shift differential of one and one quarter (1¼) times the regular straight time rate of pay for the seven hours of actual off-shift work.

(Local #7)

TIMBERPERSON

Timberperson

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $55.59
Supplemental Benefit Rate per Hour: $55.41

Overtime

Time and one half the regular rate after an 8 hour day.
Time and one half the regular rate for Saturday.
Double time the regular rate for Sunday.
Saturday may be used as a make-up day at straight time when a day is lost during that week to inclement weather.

Overtime Holidays

Double time the regular rate for work on the following holiday(s).
New Year's Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Presidential Election Day
Thanksgiving Day
Christmas Day

Paid Holidays

None

Shift Rates

Off shift work commencing between 5:00 P.M. and 11:00 P.M. shall work eight and one half hours allowing for one half hour for lunch. The wage rate shall be 113% of the straight time hourly wage rate. Benefits for off-shift work shall be paid at the straight time rate.

(Local #1556)

TUNNEL WORKER

Blasters, Mucking Machine Operators (Compressed Air Rates)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $73.50
Supplemental Benefit Rate per Hour: $64.93

Tunnel Workers (Compressed Air Rates)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $70.88
Supplemental Benefit Rate per Hour: $62.88

Top Nipper (Compressed Air Rates)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $69.69
Supplemental Benefit Rate per Hour: $61.64

Outside Lock Tender, Outside Gauge Tender,Muck Lock Tender (Compressed Air Rates)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $68.30
Supplemental Benefit Rate per Hour: $60.64

Bottom Bell & Top Bell Signal Person: Shaft Person (Compressed Air Rates)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $68.30
Supplemental Benefit Rate per Hour: $60.64

Changehouse Attendant: Powder Watchperson (Compressed Air Rates)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $60.18
Supplemental Benefit Rate per Hour: $56.85

Blasters (Free Air Rates)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $70.12
Supplemental Benefit Rate per Hour: $62.33

Tunnel Workers (Free Air Rates)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $67.08
Supplemental Benefit Rate per Hour: $59.73

All Others (Free Air Rates)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $62.01
Supplemental Benefit Rate per Hour: $55.28

Microtunneling (Free Air Rates)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $53.66
Supplemental Benefit Rate per Hour: $47.78

Overtime Description

For work performed during excavation and primary concrete tunnel lining phases - Double time the regular rate after an 8 hour day and Saturday, Sunday and on the following holiday(s) listed below.
For Repair-Maintenance Work on Existing Equipment and Facilities - Time and one half the regular rate after a 8 hour day, Saturday, Sunday and double time the regular rate for work on the following holiday(s) listed below.
For Small-Bore Micro Tunneling Machines - Time and one-half the regular rate shall be paid for all overtime.
For work not listed above - Time and one half the regular rate after an 8 hour day and Saturday and double time the regular rate on Sunday and on the following holiday(s) listed below.

Paid Holidays

New Year's Day
Martin Luther King Jr. Day
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

(Local #147)

UTILITY LOCATOR

(Locate & mark underground utilities including gas for street excavation and utility line repairs)

Utility Locator (Year 7 and above)

Effective Period: 7/1/2024 - 8/25/2024
Wage Rate per Hour: $31.56
Supplemental Benefit Rate per Hour: $1.43

Effective Period: 8/26/2024 – 6/30/2025
Wage Rate per Hour: $35.50
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Year 5 Second 6 months & Year 6)

Effective Period: 7/1/2024 - 8/25/2024
Wage Rate per Hour: $22.85
Supplemental Benefit Rate per Hour: $1.43

Effective Period: 8/26/2024 – 6/30/2025

Wage Rate per Hour: $35.50
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Year 5 fist 6 months)

Effective Period: 7/1/2024 - 8/25/2024
Wage Rate per Hour: $22.85
Supplemental Benefit Rate per Hour: $1.43

Effective Period: 8/26/2024 - 6/30/2025
Wage Rate per Hour: $34.80
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Year 4)

Effective Period: 7/1/2024 - 8/25/2024
Wage Rate per Hour: $21.54
Supplemental Benefit Rate per Hour: $1.43

Effective Period: 8/26/2024 - 6/30/2025
Wage Rate per Hour: $31.54
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Year 3)

Effective Period: 7/1/2024 - 8/25/2024
Wage Rate per Hour: $20.30
Supplemental Benefit Rate per Hour: $1.43

Effective Period: 8/26/2024 - 6/30/2025
Wage Rate per Hour: $28.28
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Year 2)

Effective Period: 7/1/2024 - 8/25/2024
Wage Rate per Hour: $19.13
Supplemental Benefit Rate per Hour: $1.43

Effective Period: 8/26/2024 - 6/30/2025
Wage Rate per Hour: $25.02
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Year 1)

Effective Period: 7/1/2024 - 8/25/2024
Wage Rate per Hour: $18.04
Supplemental Benefit Rate per Hour: $1.43

Effective Period: 8/26/2024 - 6/30/2025

Wage Rate per Hour: $21.76
Supplemental Benefit Rate per Hour: $1.43

Utility Locator (Up to 1 year)

Effective Period: 7/1/2024 - 8/25/2024
Wage Rate per Hour: $17.00
Supplemental Benefit Rate per Hour: $1.43
Supplemental Note: No benefits for the first 90 days of employment.

Effective Period: 8/26/2024 - 6/30/2025
Wage Rate per Hour: $18.50
Supplemental Benefit Rate per Hour: $1.43
Supplemental Note: No benefits for the first 90 days of employment.

Overtime
Time and one half the regular rate for work on the following holiday(s).
Time and one half the regular hourly rate after 40 straight time hours in any work week.

Paid Holidays
New Year's Day
Memorial Day
Independence Day
Thanksgiving Day
Christmas Day

Shift Rates
10% shift differential to employees working any shift starting between noon and 5 AM.

Vacation
For up to 1 year 0 hours
For year 1 - 2 48 hours per year
For year 3 - 9 96 hours per year
For year 10 or more 144 hours per year

Sick Days:
For up to 1 year employee receives 40 hours paid sick leave.
For year 1 employee earns 2 hours of paid sick leave for every 100 overtime hours worked.
For year 2 - 9 years employee earns 4 hours of paid sick leave for every 100 overtime hours worked.
For year 10 or more employee earns 6 hours of paid sick leave for every 100 overtime hours worked.

(C.W.A.)

WELDER
WELDER AND FIREWATCH TO BE PAID AT THE RATE OF THE JOURNEYPERSON OR REGISTERED APPRENTICE IN THE TRADE PERFORMING THE WORK.

OFFICE OF THE COMPTROLLER

CITY OF NEW YORK

CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Pursuant to Labor Law § 220 (3-e), only apprentices who are individually registered in a bona fide program to which the employer contractor is a participant and registered with the New York State Department of Labor, may be paid at the apprentice rates in this schedule. Apprentices who are not so registered must be paid as journey persons in accordance with the trade classification of the work they actually performed.

Apprentice ratios are established to ensure the proper safety, training and supervision of apprentices. A ratio establishes the number of journey workers required for each apprentice in a program and on a job site. Ratios are interpreted as follows: in the case of a 1:1, 1:4 ratio, there must be one journey worker for the first apprentice, and four additional journey workers for each subsequent apprentice.

ADDENDUM

List of Amended Classifications

1. BOILERMAKER
2. FLOOR COVERER
3. HAZARDOUS MATERIAL HANDLER
4. HOUSE WRECKER
5. IRON WORKER – ORNAMENTAL
6. IRON WORKER – STRUCTURAL
7. LABORER - HEAVY & HIGHWAY
8. MASON TENDER
9. PLASTERER – TENDER
10. TAPER

TABLE OF CONTENTS

CLASSIFICATION	PAGE
BOILERMAKER	4
BRICKLAYER	5
CARPENTER	6
CARPENTER - HIGH RISE CONCRETE FORMS	7
CEMENT AND CONCRETE WORKER	8
CEMENT MASON	8
DERRICKPERSON & RIGGER (STONE)	9
DOCKBUILDER/PILE DRIVER	10
ELECTRICIAN	10
ELEVATOR CONSTRUCTOR	12
ELEVATOR REPAIR & MAINTENANCE	13
ENGINEER	14
ENGINEER - OPERATING	15
FLOOR COVERER	15
GLAZIER	16
HAZARDOUS MATERIAL HANDLER	17
HEAT & FROST INSULATOR	18
HOUSE WRECKER	19
IRON WORKER - ORNAMENTAL	20
IRON WORKER - STRUCTURAL	21
LABORER - HEAVY & HIGHWAY	22
LABORER - PAVER & ROADBUILDER	22
LABORER - PAVER AND ROADBUILDER - LINE STRIPING (ROADWAY)	23
MARBLE MECHANICS	23
MASON TENDER	25
MASON TENDER (INTERIOR DEMOLITION WORKER)	26
METALLIC LATHER	27
MILLWRIGHT	27
PAINTER	28
PAINTER - BRIDGE & STRUCTURAL STEEL	29
PAINTER - METAL POLISHER	29
PLASTERER	30
PLASTERER - TENDER	31
PLUMBER	32
POINTER, WATERPROOFER, CAULKER, SANDBLASTER, STEAMBLASTER	33
ROOFER	34
SHEET METAL WORKER	35
SIGN ERECTOR	36
STEAMFITTER	37
STEAMFITTER - REFRIGERATION & AIR CONDITIONER	38
STONE MASON - SETTER	39
TAPER	40
TILE LAYER - SETTER	41
TIMBERPERSON	42

BOILERMAKER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Boilermaker (First Year)

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $34.95

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $35.27

Boilermaker (Second Year: 1st Six Months)

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $36.99

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $37.34

Boilermaker (Second Year: 2nd Six Months)

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $39.06

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $39.44

Boilermaker (Third Year: 1st Six Months)

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $41.09

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $41.50

Boilermaker (Third Year: 2nd Six Months)

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate Per Hour: 85% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $43.17

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate Per Hour: 85% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $43.59

Boilermaker (Fourth Year: 1st Six Months)

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $45.23

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $45.68

Boilermaker (Fourth Year: 2nd Six Months)

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate Per Hour: 95% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $47.28

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate Per Hour: 95% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $47.76

(Local #5)

BRICKLAYER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Bricklayer (First 750 Hours)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $27.60

Bricklayer (Second 750 Hours)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $27.60

Bricklayer (Third 750 Hours)

Effective Period: 7/1/2024 - 6/30/2025

Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $27.60

Bricklayer (Fourth 750 Hours)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $27.60

Bricklayer (Fifth 750 Hours)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $27.60

Bricklayer (Sixth 750 Hours)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 95% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $27.60

(Bricklayer District Council)

CARPENTER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Carpenter (First Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour For Building Apprentice: $22.20
Supplemental Benefit Rate Per Hour For Building Apprentice: $17.70

Wage Rate Per Hour For Heavy Apprentice: $26.98
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $37.89

Carpenter (Second Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour For Building Apprentice: $25.20
Supplemental Benefit Rate Per Hour For Building Apprentice: $19.20

Wage Rate Per Hour For Heavy Apprentice: $32.58
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $37.89

Carpenter (Third Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour For Building Apprentice: $29.45
Supplemental Benefit Rate Per Hour For Building Apprentice: $22.80

Wage Rate Per Hour For Heavy Apprentice: $40.96
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $37.89

Carpenter (Fourth Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour For Building Apprentice: $37.33
Supplemental Benefit Rate Per Hour For Building Apprentice: $24.80

Wage Rate Per Hour For Heavy Apprentice: $49.35
Supplemental Benefit Rate Per Hour For Heavy Apprentice: $37.89

(Carpenters District Council)

CARPENTER - HIGH RISE CONCRETE FORMS
(Ratio of Apprentice to Journeyperson: 1 to 1, 2 to 5)

Carpenter - High Rise (First Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $18.27
Supplemental Benefit Rate per Hour: $17.55

Carpenter - High Rise (Second Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $24.70
Supplemental Benefit Rate per Hour: $17.68

Carpenter - High Rise (Third Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $31.28
Supplemental Benefit Rate per Hour: $17.81

Carpenter - High Rise (Fourth Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $38.90

Supplemental Benefit Rate per Hour: $17.96

(Carpenters District Council)

CEMENT AND CONCRETE WORKER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Cement & Concrete Worker (First 1333 hours)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 53% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $16.44

Cement & Concrete Worker (Second 1333 hours)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 69% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $21.72

Cement & Concrete Worker (Last 1334 hours)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 85% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $23.00

(Cement Concrete Workers District Council)

CEMENT MASON
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Cement Mason (First Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $23.39
Supplemental Benefit Rate per Hour: $16.11

Cement Mason (Second Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $28.29
Supplemental Benefit Rate per Hour: $16.41

Cement Mason (Third Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $33.69
Supplemental Benefit Rate per Hour: $16.52

(Local #780)

DERRICKPERSON & RIGGER (STONE)

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Derrickperson & Rigger (stone) - First Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: 50% of Journeyperson's rate

Derrickperson & Rigger (stone) - Second Year: 1st Six Months

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: 75% of Journeyperson's rate

Derrickperson & Rigger (stone) - Second Year: 2nd Six Months

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: 75% of Journeyperson's rate

Derrickperson & Rigger (stone) - Third Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: 75% of Journeyperson's rate

(Local #197)

DOCKBUILDER/PILE DRIVER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Dockbuilder/Pile Driver (First Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: $26.98
Supplemental Benefit Rate Per Hour: $37.89

Dockbuilder/Pile Driver (Second Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: $32.58
Supplemental Benefit Rate Per Hour: $37.89

Dockbuilder/Pile Driver (Third Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: $40.96
Supplemental Benefit Rate Per Hour: $37.89

Dockbuilder/Pile Driver (Fourth Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: $49.35
Supplemental Benefit Rate Per Hour: $37.89

(Carpenters District Council)

ELECTRICIAN

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Electrician (First Term: 0-6 Months)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $18.00
Supplemental Benefit Rate per Hour: $17.18
Overtime Supplemental Rate Per Hour: $18.38

Electrician (First Term: 7-12 Months)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $18.50
Supplemental Benefit Rate per Hour: $17.44
Overtime Supplemental Rate Per Hour: $18.67

Electrician (Second Term: 0-6 Months)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $19.50
Supplemental Benefit Rate per Hour: $17.97
Overtime Supplemental Rate Per Hour: $19.26

Electrician (Second Term: 7-12 Months)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $20.50
Supplemental Benefit Rate per Hour: $18.49
Overtime Supplemental Rate Per Hour: $19.85

Electrician (Third Term: 0-6 Months)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $21.50
Supplemental Benefit Rate per Hour: $19.02
Overtime Supplemental Rate Per Hour: $20.44

Electrician (Third Term: 7-12 Months)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $22.50
Supplemental Benefit Rate per Hour: $19.54
Overtime Supplemental Rate Per Hour: $21.03

Electrician (Fourth Term: 0-6 Months)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $23.50
Supplemental Benefit Rate per Hour: $20.06
Overtime Supplemental Rate Per Hour: $21.62

Electrician (Fourth Term: 7-12 Months)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $25.50
Supplemental Benefit Rate per Hour: $21.11
Overtime Supplemental Rate Per Hour: $22.80

Electrician (Fifth Term: 0-12 Months)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $27.50
Supplemental Benefit Rate per Hour: $24.79
Overtime Supplemental Rate Per Hour: $26.52

Electrician (Fifth Term: 13-18 Months)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $32.00
Supplemental Benefit Rate per Hour: $27.20
Overtime Supplemental Rate Per Hour: $29.23

Overtime Description
Overtime Wage paid at time and one half the regular rate

(Local #3)

ELEVATOR CONSTRUCTOR
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Elevator (Constructor) - First Year

Effective Period: 7/1/2024 - 3/16/2025
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $34.78

Effective Period: 3/17/2025 - 6/30/2025
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $35.48

Elevator (Constructor) - Second Year

Effective Period: 7/1/2024 - 3/16/2025
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $35.42

Effective Period: 3/17/2025 - 6/30/2025
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $36.16

Elevator (Constructor) - Third Year

Effective Period: 7/1/2024 - 3/16/2025
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: $36.71

Effective Period: 3/17/2025 - 6/30/2025
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: $37.53

Elevator (Constructor) - Fourth Year

Effective Period: 7/1/2024 - 3/16/2025
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: $38.00

Effective Period: 3/17/2025 - 6/30/2025
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: $38.90

(Local #1)

ELEVATOR REPAIR & MAINTENANCE

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Elevator Service/Modernization Mechanic (First Year)

Effective Period: 7/1/2024 - 3/16/2025
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Per Hour: $34.75

Effective Period: 3/17/2025 - 6/30/2025
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Per Hour: $35.45

Elevator Service/Modernization Mechanic (Second Year)

Effective Period: 7/1/2024 - 3/16/2025
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Benefit Per Hour: $35.39

Effective Period: 3/17/2025 - 6/30/2025
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Benefit Per Hour: $36.13

Elevator Service/Modernization Mechanic (Third Year)

Effective Period: 7/1/2024 - 3/16/2025
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Per Hour: $36.68

Effective Period: 3/17/2025 - 6/30/2025
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Per Hour: $37.50

Elevator Service/Modernization Mechanic (Fourth Year)

Effective Period: 7/1/2024 - 3/16/2025
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Benefit Per Hour: $37.96

Effective Period: 3/17/2025 - 6/30/2025
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Benefit Per Hour: $38.86

(Local #1)

ENGINEER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 5)

Engineer - First Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $27.47
Supplemental Benefit Rate per Hour: $34.30

Engineer - Second Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $34.34
Supplemental Benefit Rate per Hour: $34.30

Engineer - Third Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $37.77
Supplemental Benefit Rate per Hour: $34.30

Engineer - Fourth Year

Effective Period: 7/1/2024 - 6/30/2025

Wage Rate per Hour: $41.21
Supplemental Benefit Rate per Hour: $34.30

(Local #15)

ENGINEER - OPERATING
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 5)

Operating Engineer - First Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 40% of Operating Engineer - Road & Heavy Construction V's Rate
Supplemental Benefit Per Hour: $26.40

Operating Engineer - Second Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 50% of Operating Engineer - Road & Heavy Construction V's Rate
Supplemental Benefit Per Hour: $26.40

Operating Engineer - Third Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 60% of Operating Engineer - Road & Heavy Construction V's Rate
Supplemental Benefit Per Hour: $26.40

(Local #14)

FLOOR COVERER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Floor Coverer (First Year)

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $25.20
Supplemental Benefit Rate per Hour: $17.25

Effective Period: 1/20/2025 - 6/30/2025

Wage Rate per Hour: $26.04
Supplemental Benefit Rate per Hour: $17.47

Floor Coverer (Second Year)

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $28.20
Supplemental Benefit Rate per Hour: $18.75

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $29.10
Supplemental Benefit Rate per Hour: $19.01

Floor Coverer (Third Year)

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $32.45
Supplemental Benefit Rate per Hour: $22.35

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $33.55
Supplemental Benefit Rate per Hour: $22.61

Floor Coverer (Fourth Year)

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $40.33
Supplemental Benefit Rate per Hour: $24.35

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $41.63
Supplemental Benefit Rate per Hour: $24.64

(Carpenters District Council)

GLAZIER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Glazier (First Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Glazier (Second Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Glazier (Third Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Glazier (Fourth Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 80% of Journeyperson's rate

(Local #1281)

HAZARDOUS MATERIAL HANDLER

(Ratio of Apprentice Journeyperson: 1 to 1, 1 to 3)

Handler (First 1000 Hours)

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $20.00
Supplemental Benefit Rate per Hour: $15.10

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $20.20
Supplemental Benefit Rate per Hour: $16.35

Handler (Second 1000 Hours)

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $21.00
Supplemental Benefit Rate per Hour: $15.10

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $21.20
Supplemental Benefit Rate per Hour: $16.35

Handler (Third 1000 Hours)

Effective Period: 7/1/2024 - 1/19/2025

Wage Rate per Hour: $24.00
Supplemental Benefit Rate per Hour: $15.10

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $24.20
Supplemental Benefit Rate per Hour: $16.35

Handler (Fourth 1000 Hours)

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $26.00
Supplemental Benefit Rate per Hour: $15.10

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $26.20
Supplemental Benefit Rate per Hour: $16.35

(Local #78)

HEAT & FROST INSULATOR

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Heat & Frost Insulator (First Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Heat & Frost Insulator (Second Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Heat & Frost Insulator (Third Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Heat & Frost Insulator (Fourth Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 70% of Journeyperson's rate

(Local #12)

HOUSE WRECKER
(TOTAL DEMOLITION)
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

House Wrecker - First Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $21.55
Supplemental Benefit Rate per Hour: $11.27

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $21.75
Supplemental Benefit Rate per Hour: $11.62

House Wrecker - Second Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $23.30
Supplemental Benefit Rate per Hour: $11.27

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $23.50
Supplemental Benefit Rate per Hour: $11.62

House Wrecker - Third Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $24.80
Supplemental Benefit Rate per Hour: $11.27

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $25.00
Supplemental Benefit Rate per Hour: $11.62

House Wrecker - Fourth Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $27.30
Supplemental Benefit Rate per Hour: $11.27

Effective Period: 1/20/2025 - 6/30/2025

Wage Rate per Hour: **$27.50**
Supplemental Benefit Rate per Hour: **$11.62**

(Mason Tenders District Council)

IRON WORKER - ORNAMENTAL

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Iron Worker (Ornamental) - First Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: **$25.98**
Supplemental Benefit Rate per Hour: **$16.00**

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: **$27.40**
Supplemental Benefit Rate per Hour: **$16.00**

Iron Worker (Ornamental) - Second Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: **$28.45**
Supplemental Benefit Rate per Hour: **$18.00**

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: **$30.02**
Supplemental Benefit Rate per Hour: **$18.00**

Iron Worker (Ornamental) - Third Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: **$30.80**
Supplemental Benefit Rate per Hour: **$19.00**

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: **$32.49**
Supplemental Benefit Rate per Hour: **$19.00**

Iron Worker (Ornamental) - Fourth Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: **$34.39**
Supplemental Benefit Rate per Hour: **$21.00**

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $36.27
Supplemental Benefit Rate per Hour: $21.00

(Local #580)

IRON WORKER - STRUCTURAL

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Iron Worker (Structural) - 1st Six Months

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $30.23
Supplemental Benefit Rate per Hour: $61.90

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $30.36
Supplemental Benefit Rate per Hour: $62.91

Iron Worker (Structural) - 7- 18 Months

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $30.83
Supplemental Benefit Rate per Hour: $61.90

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $30.96
Supplemental Benefit Rate per Hour: $62.91

Iron Worker (Structural) - 19 - 36 months

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $31.44
Supplemental Benefit Rate per Hour: $61.90

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $31.57
Supplemental Benefit Rate per Hour: $62.91

(Local #40 and #361)

LABORER - HEAVY & HIGHWAY

(Ratio Apprentice to Journeyperson: 1 to 1, 1 to 3)

Laborer - Heavy & Highway - First 1000 hours

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $54.03

Laborer - Heavy & Highway - Second 1000 hours

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: 54.03

Laborer - Heavy & Highway - Third 1000 hours

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: 54.03

Laborer - Heavy & Highway - Fourth 1000 hours

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Rate Per Hour: $54.03

(Local #731)

LABORER - PAVER & ROADBUILDER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Paver and Roadbuilder - First Year (Minimum 1000 hours)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $31.36
Supplemental Benefit Rate per Hour: $26.67

Paver and Roadbuilder - Second Year (Minimum 1000 hours)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $33.00
Supplemental Benefit Rate per Hour: $26.67

(Local#1010)

LABORER - PAVER AND ROADBUILDER - LINE STRIPING (ROADWAY)

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Paver and Roadbuilder - Line Striping (Roadway) - First Year (Minimum 1000 hours)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $31.36
Supplemental Benefit Rate per Hour: $19.27

Paver and Roadbuilder - Line Striping (Roadway) - Second Year (Minimum 1000 hours)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $33.00
Supplemental Benefit Rate per Hour: $19.27

(Local #1010)

MARBLE MECHANICS

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Cutters & Setters - First 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

Cutters & Setters - Second 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 45% of Journeyperson's rate

Cutters & Setters - Third 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Cutters & Setters - Fourth 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 55% of Journeyperson's rate

Cutters & Setters - Fifth 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Cutters & Setters - Sixth 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 65% of Journeyperson's rate

Cutters & Setters - Seventh 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 70% of Journeyperson's rate

Cutters & Setters - Eighth 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

Cutters & Setters - Ninth 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 85% of Journeyperson's rate

Cutters & Setters - Tenth 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 95% of Journeyperson's rate

Polishers & Finishers - First 900 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 70% of Journeyperson's rate

NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

Polishers & Finishers - Second 900 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 80% of Journeyperson's rate

Polishers & Finishers - Third 900 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 90% of Journeyperson's rate

(Local #7)

MASON TENDER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Mason Tender - First Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $22.05
Supplemental Benefit Rate per Hour: $10.77

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $21.75
Supplemental Benefit Rate per Hour: $11.62

Mason Tender - Second Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $23.80
Supplemental Benefit Rate per Hour: $10.77

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $23.50
Supplemental Benefit Rate per Hour: $11.62

Mason Tender - Third Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $25.30
Supplemental Benefit Rate per Hour: $10.77

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $25.00
Supplemental Benefit Rate per Hour: $11.62

Mason Tender - Fourth Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $27.80
Supplemental Benefit Rate per Hour: $10.77

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $27.50
Supplemental Benefit Rate per Hour: $11.62

(Local #79)

MASON TENDER (INTERIOR DEMOLITION WORKER)

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Mason Tender (Interior Demolition) - First Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $21.30
Supplemental Benefit Rate per Hour: $10.97

Mason Tender (Interior Demolition) - Second Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $23.05
Supplemental Benefit Rate per Hour: $10.97

Mason Tender (Interior Demolition) - Third Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $24.55
Supplemental Benefit Rate per Hour: $10.97

Mason Tender (Interior Demolition) - Fourth Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $27.05

Supplemental Benefit Rate per Hour: $10.97

(Local #79)

METALLIC LATHER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Metallic Lather (First Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $22.55
Supplemental Benefit Rate per Hour: $17.87

Metallic Lather (Second Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $23.60
Supplemental Benefit Rate per Hour: $16.87

Metallic Lather (Third Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $24.60
Supplemental Benefit Rate per Hour: $15.92

Metallic Lather (Fourth Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $25.65
Supplemental Benefit Rate per Hour: $14.92

(Local #46)

MILLWRIGHT
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Millwright (First Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $32.16
Supplemental Benefit Rate per Hour: $37.78

Millwright (Second Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $37.61
Supplemental Benefit Rate per Hour: $41.48

Millwright (Third Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $43.06
Supplemental Benefit Rate per Hour: $45.83

Millwright (Fourth Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $53.96
Supplemental Benefit Rate per Hour: $52.59

(Local #740)

PAINTER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Painter - Brush & Roller - First Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $17.60
Supplemental Benefit Rate per Hour: $19.09

Painter - Brush & Roller - Second Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $22.00
Supplemental Benefit Rate per Hour: $24.46

Painter - Brush & Roller - Third Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $26.40
Supplemental Benefit Rate per Hour: $28.80

Painter - Brush & Roller - Fourth Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $35.20
Supplemental Benefit Rate per Hour: $37.24

(District Council of Painters)

PAINTER - BRIDGE & STRUCTURAL STEEL
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Painter - Bridge & Structural Steel (First Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Painter - Bridge & Structural Steel (Second Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Painter - Bridge & Structural Steel (Third Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 80% of Journeyperson's rate

(Local #806)

PAINTER - METAL POLISHER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Metal Polisher (First Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $19.67
Supplemental Benefit Rate per Hour: $8.66
New Construction - Wage Rate Per Hour: $20.06
Scaffold Over 34 Feet - Wage Rate Per Hour: $22.17

Metal Polisher (Second Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $21.63
Supplemental Benefit Rate per Hour: $8.66
New Construction - Wage Rate Per Hour: $22.07
Scaffold Over 34 Feet - Wage Rate Per Hour: $24.13

Metal Polisher (Third Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $23.60
Supplemental Benefit Rate per Hour: $8.66
New Construction - Wage Rate Per Hour: $24.14
Scaffold Over 34 Feet - Wage Rate Per Hour: $26.10

(Local 8A-28)

PLASTERER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)
(Each Term is 800 Hours.)

Plasterer - First Term

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $17.48

Plasterer - Second Term

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: $18.63

Plasterer - Third Term

Effective Period: 7/1/2024 - 6/30/2025

Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: $20.93

Plasterer - Fourth Term

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: $22.10

(Local #262)

PLASTERER - TENDER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Plasterer Tender - First Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $21.55
Supplemental Benefit Rate per Hour: $11.27

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $21.75
Supplemental Benefit Rate per Hour: $11.62

Plasterer Tender - Second Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $23.30
Supplemental Benefit Rate per Hour: $11.27

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $23.50
Supplemental Benefit Rate per Hour: $11.62

Plasterer Tender - Third Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $24.80
Supplemental Benefit Rate per Hour: $11.27

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $25.00
Supplemental Benefit Rate per Hour: $11.62

Plasterer Tender - Fourth Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $27.30
Supplemental Benefit Rate per Hour: $11.27

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $27.50
Supplemental Benefit Rate per Hour: $11.62

(Local #79)

PLUMBER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Plumber - First Year: 1st Six Months

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $19.00
Supplemental Benefit Rate per Hour: $5.43

Plumber - First Year: 2nd Six Months

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $21.00
Supplemental Benefit Rate per Hour: $6.43

Plumber - Second Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $30.22
Supplemental Benefit Rate per Hour: $22.73

Plumber - Third Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $32.32
Supplemental Benefit Rate per Hour: $22.73

Plumber - Fourth Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $35.17
Supplemental Benefit Rate per Hour: $22.73

Plumber - Fifth Year: 1st Six Months

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $36.57
Supplemental Benefit Rate per Hour: $22.73

Plumber - Fifth Year: 2nd Six Months

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $48.64
Supplemental Benefit Rate per Hour: $22.73

(Plumbers Local #1)

POINTER, WATERPROOFER, CAULKER, SANDBLASTER, STEAMBLASTER

(Exterior Building Renovation)
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - First Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $32.76
Supplemental Benefit Rate per Hour: $15.10

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Second Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $37.09
Supplemental Benefit Rate per Hour: $20.30

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Third Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $42.97
Supplemental Benefit Rate per Hour: $24.05

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Fourth Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $51.60
Supplemental Benefit Rate per Hour: $25.05

(Bricklayer District Council)

ROOFER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Roofer - First Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 38% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $7.67

Roofer - Second Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 45% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $17.69

Roofer - Third Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $19.61

Roofer - Fourth Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $23.45

Roofer - Fifth Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Benefit Rate Per Hour: $29.22

(Local #8)

SHEET METAL WORKER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Sheet Metal Worker (0-6 Months)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 25% of Journeyperson's rate
Supplemental Rate Per Hour: $7.64

Sheet Metal Worker (7-18 Months)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 35% of Journeyperson's rate
Supplemental Rate Per Hour: $21.49

Sheet Metal Worker (19-30 Months)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 45% of Journeyperson's rate
Supplemental Rate Per Hour: $29.09

Sheet Metal Worker (31-36 Months)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $34.41

Sheet Metal Worker (37-42 Months)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $34.41

Sheet Metal Worker (43-48 Months)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: $42.42

Sheet Metal Worker (49-54 Months)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: $42.42

Sheet Metal Worker (55-60 Months)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: $47.76

(Local #28)

SIGN ERECTOR

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Sign Erector - First Year: 1st Six Months

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 35% of Journeyperson's rate
Supplemental Rate Per Hour: $17.84

Sign Erector - First Year: 2nd Six Months

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 40% of Journeyperson's rate
Supplemental Rate Per Hour: $20.25

Sign Erector - Second Year: 1st Six Months

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 45% of Journeyperson's rate
Supplemental Rate Per Hour: $22.66

Sign Erector - Second Year: 2nd Six Months

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: $25.09

Sign Erector - Third Year: 1st Six Months

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: $33.83

Sign Erector - Third Year: 2nd Six Months

Effective Period: 7/1/2024 - 6/30/2025

Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: $36.81

Sign Erector - Fourth Year: 1st Six Months

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: $40.63

Sign Erector - Fourth Year: 2nd Six Months

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: $43.70

Sign Erector - Fifth Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: $46.76

Sign Erector - Sixth Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: $49.80

(Local #137)

STEAMFITTER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Steamfitter - First Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate and Supplemental Per Hour: 40% of Journeyperson's rate

Steamfitter - Second Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate and Supplemental Rate Per Hour: 50% of Journeyperson's rate.

Steamfitter - Third Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate and Supplemental Rate per Hour: 60% of Journeyperson's rate.

Steamfitter - Fourth Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate and Supplemental Rate Per Hour: 70% of Journeyperson's rate.

Steamfitter - Fifth Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate and Supplemental Rate Per Hour: 80% of Journeyperson's rate.

(Local #638)

STEAMFITTER - REFRIGERATION & AIR CONDITIONER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Refrigeration & Air Conditioner (First Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $22.31
Supplemental Benefit Rate per Hour: $14.47

Refrigeration & Air Conditioner (Second Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $26.94
Supplemental Benefit Rate per Hour: $15.91

Refrigeration & Air Conditioner (Third Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $31.38
Supplemental Benefit Rate per Hour: $17.41

Refrigeration & Air Conditioner (Fourth Year)

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate per Hour: $37.90
Supplemental Benefit Rate per Hour: $19.44

(Local #638-B)

STONE MASON - SETTER

(Ratio Apprentice of Journeyperson: 1 to 1, 1 to 2)

Stone Mason - Setters - First 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Second 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Third 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Fourth 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Fifth 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 90% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

Stone Mason - Setters - Sixth 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: 100% of Journeyperson's rate
Supplemental Rate Per Hour: 50% of Journeyperson's rate

(Bricklayers District Council)

TAPER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Drywall Taper - First Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $21.75
Supplemental Benefit Rate per Hour: $15.00

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $22.13
Supplemental Benefit Rate per Hour: $14.40

Drywall Taper - Second Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $24.24
Supplemental Benefit Rate per Hour: $24.71

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $24.24
Supplemental Benefit Rate per Hour: $24.56

Drywall Taper - Third Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $29.08
Supplemental Benefit Rate per Hour: $26.67

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $29.08
Supplemental Benefit Rate per Hour: $26.59

Drywall Taper - Fourth Year

Effective Period: 7/1/2024 - 1/19/2025
Wage Rate per Hour: $38.78
Supplemental Benefit Rate per Hour: $30.59

Effective Period: 1/20/2025 - 6/30/2025
Wage Rate per Hour: $38.78
Supplemental Benefit Rate per Hour: $30.65

(Local #1974)

TILE LAYER - SETTER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Tile Layer - Setter - First 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour:35% of Journeyperson's rate

Tile Layer - Setter - Second 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour 40% of Journeyperson's rate

Tile Layer - Setter - Third 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Tile Layer - Setter - Fourth 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 55% of Journeyperson's rate

Tile Layer - Setter - Fifth 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Tile Layer - Setter - Sixth 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 65% of Journeyperson's rate

Tile Layer - Setter - Seventh 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 70% of Journeyperson's rate

Tile Layer - Setter - Eighth 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

Tile Layer - Setter - Ninth 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour:80% of Journeyperson's rate

Tile Layer - Setter - Tenth 750 Hours

Effective Period: 7/1/2024 - 6/30/2025
Wage and Supplemental Rate Per Hour: 90% of Journeyperson's rate

(Local #7)

TIMBERPERSON
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Timberperson - First Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: $24.96
Supplemental Rate Per Hour: $37.69

Timberperson - Second Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: $30.07
Supplemental Rate Per Hour: $37.69

Timberperson - Third Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: $37.72
Supplemental Rate Per Hour: $37.69

Timberperson - Fourth Year

Effective Period: 7/1/2024 - 6/30/2025
Wage Rate Per Hour: $45.38
Supplemental Rate Per Hour: $37.69

(Local #1536)

Leonard A. Mancusi
SENIOR ASSISTANT COMPTROLLER

THE CITY OF NEW YORK
OFFICE OF THE COMPTROLLER
1 CENTRE STREET ROOM 1120
NEW YORK, N.Y. 10007-2341

TELEPHONE: (212) 669-3622
FAX NUMBER: (212) 669-8499

ALAN G. HEVESI
COMPTROLLER

MEMORANDUM

November 6, 2000

To *Agency Chief Contracting Officers*

From: *Leonard A. Mancusi*

Re: *Security at Construction Sites*

Prior to the enactment of Administrative Code §6-109, security guards on construction sites were not subject to prevailing wages. Security guards under the New York State labor law are covered under §230 which provides that prevailing wages are to be paid for security guards in existing buildings. §6-109 of the Administrative Code which was enacted in 1996 closed this loophole by including all security guards working pursuant to a city contract as a prevailing wage trade.

Although some construction contract boilerplate language has been amended to include §6-109, sub-contractors performing security services have advised us that they were not aware of this provision and, since traditionally, security guards were not a covered trade on construction sites, and they were not advised by a prime contractor that they would have to pay prevailing wages, they have not been doing so.

To avoid the possibility of issuing stop payments against prime contractors for the failure of their security service sub-contractors to pay

prevailing wages, we suggest that you write to all your existing security guard sub-contractors and their primes and in the future, upon approval of a security guard sub-contractor, advise the contractors of their obligation to pay prevailing wages under §6-109 of the Administrative Code.

As always, your cooperation is appreciated.

LAM:er
ACCO.SECURITY AT SITES

Changes between the 7/1/2023 and 7/1/2024 Single Contract General Conditions

NOTE: The list below is intended as a guide and does not include minor editing.
The text of the General Conditions and the Addendum to the General Conditions govern.

Section No.	Change
01 21 00.10	Section number revised
01 21 00.20	Section number revised
01 21 10.30	New Section Added
01 29 00	1.5.A: Added “mobilization” 1.5.B: Added “Due Date” 1.5.E.2: Added “within the continental United States”
01 40 00	1.10: Added section regarding offsite Special Inspections
01 42 00	1.4: Added reference to Fenestration and Glazing Industry Alliance (FGIA)
01 50 00	3.5.H.3: Removed extra allowance 3.8.D.3.a: Updated link to website 3.14.G: Added section regarding NYCPURS
01 91 13	Updated Commissioning requirements throughout

Department of Design and Construction

Issue Date: July 1, 2024

DDC STANDARD GENERAL CONDITIONS

FOR SINGLE CONTRACT PROJECTS

DIVISION 01 – DDC STANDARD GENERAL CONDITIONS – SINGLE CONTRACT PROJECTS
TABLE OF CONTENTS

SECTION NO.	SECTION TITLE
01 10 00	SUMMARY
01 21 00.10	PRICE ADJUSTMENT ALLOWANCE
01 21 00.20	EXPANDED WORK ALLOWANCE
01 21 00.30	PROJECT WORK ACCELERATION ALLOWANCE
01 25 00	SUBSTITUTION PROCEDURES
01 29 00	PAYMENT PROCEDURES
01 31 00	PROJECT MANAGEMENT AND COORDINATION
01 32 00	CONSTRUCTION PROGRESS DOCUMENTATION
01 32 16.10	PROJECT SCHEDULES (METHOD A)
01 32 16.20	PROJECT SCHEDULES (METHOD B)
01 32 16.30	PROJECT SCHEDULES (METHOD C)
01 32 33	PHOTOGRAPHIC DOCUMENTATION
01 33 00	SUBMITTAL PROCEDURES
01 35 03	GENERAL MECHANICAL REQUIREMENTS
01 35 06	GENERAL ELECTRICAL REQUIREMENTS
01 35 26	SAFETY REQUIREMENTS PROCEDURES
01 35 91	HISTORIC TREATMENT PROCEDURES
01 40 00	QUALITY REQUIREMENTS
01 42 00	REFERENCES
01 50 00	TEMPORARY FACILITIES, SERVICES AND CONTROLS
01 54 11	TEMPORARY ELEVATORS AND HOISTS
01 54 23	TEMPORARY SCAFFOLDING AND PLATFORMS
01 60 00	PRODUCT REQUIREMENTS
01 73 00	EXECUTION
01 74 19	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
01 77 00	CLOSEOUT PROCEDURES
01 78 39	CONTRACT RECORD DOCUMENTS
01 79 00	DEMONSTRATION AND OWNERS PRE-ACCEPTANCE ORIENTATION
01 81 13.03	SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS
01 81 13.04	SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS

SECTION NO.	SECTION TITLE
01 81 13.10	ENVIRONMENTALLY PREFERABLE PURCHASING (EPP) COMPLIANCE
01 81 13.13	VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED V3 BUILDINGS
01 81 19	INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS
01 81 21	SUSTAINABLE CONSTRUCTION REQUIREMENTS
01 91 13	GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS
01 91 15	GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE

SECTION 01 10 00
SUMMARY

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. Addendum to the General Conditions: These General Conditions include and are supplemented by the Addendum to the General Conditions (the "Addendum"). The Addendum includes the following: (1) schedules referred to in these General Conditions, (2) information regarding the applicability of various articles, and (3) amended articles, if any.

1.2 SUMMARY:

A. This section includes the following:

1. Scope and Intent
2. Provisions Referenced in the Contract
3. Performance of Work During Non-Regular Work Hours (Pursuant to a Change Order)
4. Interruption of Services at Existing Facilities

1.3 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" means the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.4 SCOPE AND INTENT:

A. Description of Project: Refer to the Addendum for a description of the Project.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.4 B

B. LEED: The City of New York will seek U.S. Green Building Council (USGBC) LEED (Leadership in Energy and Environmental Design) certification for this Project as specified in Section 01 81 13.03 "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS"; or Section 01 81 13.04 "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS", and the Addendum to the General Conditions.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.4 C

C. COMMISSIONING: The Project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning must be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS, and/ or Section 01 91 15 GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE and the Addendum to the General Conditions. The Contractor must cooperate with the commissioning agent and provide whatever assistance is required.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.4 D

D. PROGRESS SCHEDULE: Refer to Section 01 32 16.1 PROGRESS SCHEDULES (METHOD A) or 01 32 16.2 PROGRESS SCHEDULES (METHOD B) or 01 32 16.3 PROGRESS SCHEDULES (METHOD C) and the Addendum to the General Conditions for requirements of the Project.

E. COMPLETION OF WORK: Work to be done under the Contract is comprised of the furnishing of all labor, materials, equipment and other appurtenances, and obtaining all regulatory agency approvals necessary and required to complete the construction work in accordance with the Contract.

F. OMISSION OF DETAILS: All work called for in the Specifications applicable to the Contract but not shown on the Contract Drawings in their present form, or vice versa, is required, and must be performed by the Contractor as though it were originally delineated or described. The cost of such work will be deemed included in the total Contract Price.

G. WORK NOT IN SPECIFICATIONS OR CONTRACT DRAWINGS: Work not particularly specified in the Specifications nor detailed on the Contract Drawings but involved in carrying out their intent or in the complete and proper execution of the Work, is required, and must be performed by the Contractor. The cost of such work will be deemed included in the total Contract Price.

H. SILENCE OF THE SPECIFICATIONS: The apparent silence of the Specifications as to any detail, or the apparent omission from them of a detailed description concerning any work to be done and materials to be furnished, will be regarded as meaning that only the best practice is to prevail and that only the best material and workmanship is to be used and interpretation of the Specifications will be made upon that basis.

I. CONFLICT BETWEEN CONTRACT DRAWINGS AND SPECIFICATIONS: Should any conflict occur in or between the Drawings and Specifications, the Contractor will be deemed to have estimated the most expensive way of doing the Work unless the Contractor asked for and obtained a decision in writing from the Commissioner before the submission of the bid as to what must govern.

1.5 CONTRACT DRAWINGS AND SPECIFICATIONS:

A. SCHEDULE C - The Contract Drawings are listed in Schedule C, which is set forth in the Addendum. Such drawings referred to in the Contract, and in the applicable Specifications for the Contract, bear the general title:

City of New York
Department of Design and Construction
Division of Public Buildings

B. DOCUMENTS FURNISHED TO THE CONTRACTOR - After the award of the Contract, the Contractor will be furnished with five (5) complete sets of paper prints of all Contract Drawings mentioned in Paragraph A above, as well as a copy of the Specifications.

C. ADDITIONAL COPIES of Drawings and Specifications, when requested, will be furnished to the Contractor if available.

D. SUPPLEMENTARY DRAWINGS - When, in the opinion of the Commissioner, it becomes necessary to more fully explain the work to be done, or to illustrate the work further, or to show any changes which may be required, drawings known as Supplementary Drawings will be prepared by the Commissioner.

E. COMPENSATION - Where Supplementary Drawings entail extra work, compensation therefore to the Contractor will be subject to the terms of the Contract. The Supplementary Drawings will be binding upon the Contractor with the same force as the Contract Drawings.

F. SUPPLEMENTARY DRAWING PRINTS - Three (3) copies of prints of these Supplementary Drawings will be furnished to the Contractor.

G. COPIES TO SUBCONTRACTORS - The Contractor must furnish each of its Subcontractors and material suppliers such copies of Contract Drawings, Supplementary Drawings, or copies of the Specifications as may be required for its work.

1.6 COORDINATION:

A. COORDINATION AND COOPERATION - The Contractor must consult and study the requirements of the Contract Drawings and Specifications for all required work, including all work to be performed by trade Subcontractors, so that the Contractor may become acquainted with the work of the Project as a whole in order to achieve the proper coordination and cooperation necessary for the efficient and timely performance of the work.

B. CONTRACTOR TO CHECK DRAWINGS: - The Contractor must verify all dimensions, quantities and details shown on the Contract Drawings, Schedules, or other data received from the Commissioner, and must notify the Commissioner of all errors, omissions, conflicts and discrepancies found therein. Notice of such errors will be given before the Contractor proceeds with any work. Figures must be used in preference to scale dimensions and large-scale drawings in preference to small-scale drawings.

1.7 SHOP DRAWINGS AND RECORD DRAWINGS:

A. Refer to Section 01 33 00 SUBMITTAL PROCEDURES and Section 01 78 39 CONTRACT RECORD DOCUMENTS for requirements applicable to shop drawings and record drawings.

1.8 TEMPORARY FACILITIES, SERVICES AND CONTROLS:

A. Refer to Section 01 50 00 TEMPORARY FACILITIES SERVICES AND CONTROLS for the responsibilities of the Contractor.

1.9 DUST CONTROL:

A. The Contractor must prepare, execute and manage a “Dust Control Plan” for the prevention of the emission of dust from construction related activities in compliance with 15 RCNY 13-01 et. seq.

1.10 PROVISIONS REFERENCED IN THE CONTRACT:

A. SCHEDULE A - Various Articles of the Contract refer to requirements set forth in Schedule A of the General Conditions. Schedule A, which is included in the Addendum, sets forth (1) the referenced Articles of the Contract, and (2) the specific requirements applicable to the Contract.

B. EXTENSION OF TIME - Applications for Extensions of Time, as indicated in Article 13 of the Contract, must be made in accordance with the Rules of the Procurement Policy Board.

C. ULTRA LOW SULFUR DIESEL FUEL AND BEST AVAILABLE TECHNOLOGY REPORTING: The Contractor must submit reports to the Commissioner regarding the use of Ultra Low Sulfur Diesel Fuel in Non-Road Vehicles, and the implementation of Best Available Technology (BAT), as set forth in Article 5.4 of the Contract. Such reports must be submitted in accordance with the schedule, format, directions, and procedures established by the Commissioner.

1.11 PERFORMANCE OF WORK DURING NON-REGULAR WORK HOURS:

A. NON-REGULAR WORK HOURS: The Commissioner may issue a change order in accordance with Article 25 of the Contract which, (1) directs the Contractor to perform the Work, or specific components thereof, during other than regular work hours (i.e., evenings, weekends and holidays), and (2) provides compensation to the Contractor for costs in connection with the performance of Work during other than regular work hours. The Commissioner may issue a change order if a delay has occurred and such delay is not the fault of the Contractor, or if the Work is of such an important nature that delay in completing such work would result in serious disadvantage to the public.

B. PROCEDURE: The Contractor must: (1) obtain whatever permits may be required for performance of the Work during other than regular business hours, and (2) pay all necessary fees in connection with such permits. In addition, if directed by the Commissioner, the Contractor must make immediate application to the Commissioner of the Department of Labor, State of New York, for dispensation in accordance with Subdivision 2 of Section 220 of the Labor Law.

1.12 INTERRUPTION OF SERVICES AT EXISTING FACILITIES:

A. EVENING AND WEEKEND WORK - Where performance of the Work requires the temporary shutdown(s) of services, such shutdown(s) must be made at night or on weekends or at such times that will cause no interference with the established routines and operations of the facility in question.

1 Where weekend or evening work is required due to unavoidable service shutdowns, such work will be performed at no extra cost to the City. Components of the Work that must be performed during other than regular work hours are indicated in the Drawings and/or the Specifications.

B. INTERRUPTION OF EXISTING FACILITIES:

1 The Contractor must not interrupt any of the services of the facility nor interfere with such services in any way without the permission of the Commissioner. Such interruption or interferences must be made as brief as possible, and only at such time stated.

2 Under no circumstances will the Contractor, its Subcontractors, or its workers, be permitted to use any part of the project as a shop, without the permission of the Commissioner.

3 Unnecessary noise must be avoided at all times and necessary noise must be reduced to a minimum.

4 Toilet facilities, water, and electricity must be operational at all times (i.e. 24/7). No services of the facility can be interrupted in any way without the permission of the Commissioner. Careful coordination of all Work with the Commissioner must be done to maintain the operational level of the Project personnel at the facility.

5 The Contractor must schedule the Work to avoid noise interference that will affect the normal functions of the facility. In particular, construction operations producing noises that are objectionable to the functions of the facility must be scheduled at times of day or night, day of the week, or weekend, which will not interfere with personnel at the facility. Any additional cost resulting from this scheduling will be borne by the Contractor.

6 The Contractor must arrange to work continuously, including evening and weekend hours, if required,

to assure that services will be shut down only during the time actually required to make the necessary connections to the existing facility.

7 The Contractor must give ample written notice in advance to the Commissioner and personnel at the facility of any required shutdown.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 10 00

SECTION 01 21 00.10

PRICE ADJUSTMENT ALLOWANCE

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 21 00.10

PART I - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) City of New York Standard Construction Contract.

1.2 SUMMARY

A. This Section includes:

1. Asphalt Price Adjustment
2. Fuel Price Adjustment
3. Steel Price Adjustment

1.3 SCOPE AND INTENT

A. This section will provide for additional compensation to the Contractor for increases, or repayment by the Contractor for decreases, in the price of asphalt, fuel, or steel products.

B. Price Adjustments will be made only for eligible work as defined below. With respect to asphalt and steel eligible work items, price adjustment will be paid, if eligible, only after the items have been permanently incorporated into the Work and accepted by the Commissioner. With respect to fuel, price adjustment will be paid, if eligible, only after fuel has been delivered to the Project site.

C. No adjustment will be provided for any extra work paid by fixed price in accordance with the Standard Construction Contract Article 25.3.2 or paid for on a time and material basis per Standard Construction Contract Article 26. Additional quantities of existing Contract pay items at original bid prices will be considered eligible for asphalt, fuel, and steel price adjustments.

D. Temporary work performed by the Contractor at its own expense will not be eligible for price adjustment. Notwithstanding the foregoing, temporary asphalt will be eligible if shown on the Contract Drawings or required to complete the Work and must be approved in advance by the Commissioner.

E. The Contractor, its Subcontractor(s) and/or Materialmen, must, when directed by the Commissioner, provide

any and all Project documents and/or records the Commissioner deems pertinent to his/her determination with respect to the price adjustment. If requested by the Commissioner, the Contractor, its Subcontractor(s) and/or Materialmen, must provide copies of Project documents and/or records.

F. Failure by the Contractor, its Subcontractor(s) and/or Materialmen, to comply strictly with the requirement to provide Project records will constitute a waiver of any claim for additional compensation the Contractor may have in connection with the price adjustment request.

G. Project documents and/or records include, without limitation, Bid and Contract Documents, shop drawings, manufacturing and/or shipping data, as-built drawings, books of account, financial statements, invoices, vouchers, records, daily job diaries and reports.

H. If the Contractor is paid additional compensation in accordance with this Section, the Contractor must pay a properly allocated share of such additional compensation to the applicable Subcontractor(s) and/or Materialmen.

1.4 PRICE ADJUSTMENT VALUES

A. The monthly average asphalt prices, monthly average fuel prices, steel cost basis and steel index values will be posted on the NYS Department of Transportation (NYSDOT) website: https://www.dot.ny.gov/main/business-center/contractors/construction-division/fuel-asphalt-steel-price-adjustments

B. Historical index values are available as issued Engineering Bulletins on the NYSDOT website: https://www.dot.ny.gov/eieb

1.5 ASPHALT PRICE ADJUSTMENT

A. **Price Changes.** The asphalt price adjustment will be based solely on the price changes for asphalt as determined by the formulas below. No adjustment will be made if the monthly average posted price is within $15.00 of the asphalt index price. No consideration will be given to the situation where the price paid by the Contractor, its Subcontractors, or the Contractor's or Subcontractor's supplier(s) exceeds the monthly average posted price.

B. **Applicability**. The asphalt price adjustment will apply to all permanent asphalt pavement items. The asphalt price adjustment will apply to temporary asphalt pavement if the temporary asphalt is shown on the Contract Drawings or approved in advance by the Commissioner. No price adjustment will be made for tack coat or pothole cold patch.

C. **Prices**. The asphalt index price and the monthly average posted price are defined as follows:

1. Asphalt Index Price. The asphalt index price is a price per ton of binder (also referred to as liquid bitumen or asphaltic cement) used solely as a basis from which to compute asphalt price adjustments. The asphalt index price will be the monthly average posted price for the month and year the bid opening for the Project.

2. Monthly Average Posted Price. The monthly asphalt index prices will be determined by NYSDOT using the methods set forth in NYSDOT Standard Specification Section 698.

D. **Quantity**. The quantity of asphalt in tons considered for adjustment will be determined by the tons of asphalt

actually placed. This will be calculated using the measured volume of asphalt placed, and the asphalt's in-place density, as measured in the field. Quantities of asphalt will be measured to the nearest 0.1 ton.

E. **Adjustment**. Asphalt price adjustment will be based on the following formulas:

1. When price increases: Price Adjustment = (Quantity of Asphalt) x (Monthly Average Posted Price – Asphalt Index Price - $15.00)

2. When price decreases: Price Adjustment = (Quantity of Asphalt) x (Monthly Average Posted Price – Asphalt Index Price + $15.00)

F. **Payment of the Price Adjustment.** The Contractor is required to keep a log of all asphalt incorporated into the Project that is eligible for the price adjustment. The log must keep track of the date when the asphalt was purchased, the quantity of the asphalt, the Asphalt Index Price and the Monthly Average Posted Price, as determined in accordance with 1.5.C.

1. When the adjustment amount, calculated in accordance with 1.5.E, exceeds $10,000.00 for all eligible asphalt incorporated into the Project, the Contractor must submit with its monthly payment requisition, the request for payment of the asphalt price adjustment.

1.6 FUEL PRICE ADJUSTMENT

A. **Price Changes**. The fuel price adjustment will be based solely on the price changes for fuel as determined by the formulas below. No adjustment will be made if the monthly average posted price is within $0.10 per gallon of the fuel index price. No consideration will be given to the situation where the price paid by the Contractor, its Subcontractors, or the Contractor's or Subcontractor's supplier(s) exceeds the monthly average posted price.

B. **Applicability**. The intent of the fuel price adjustment is to cover on-site equipment and vehicles only as delineated below.

1. The fuel price adjustment will apply for fuel used in:
   a. Diesel equipment used on site, such as backhoes, excavators, cranes.
   b. Stationary equipment used on site, such as trailer or skid mounted compressors, generators, or light towers.
   c. Gasoline or diesel trucks and vans that are assigned to the site full-time, which may be used for off-site pickups and deliveries.
   d. Equipment used for temporary heating.

2. The fuel price adjustment will not apply to:
   a. On-site gasoline powered hand tools, such as chainsaws, cut-off saws, pressure washers, small generators, etc.
   b. Vehicles (cars, pickup trucks) that are also used for commuting.
   c. Delivery vehicles.
   d. Any equipment at the Contractor's shop, manufacturer's shop, or other off-site facility.

C. **Prices**. The fuel index price and the monthly average posted price are defined as follows:

1. Fuel Index Price. A price per gallon of fuel used solely as a basis from which to compute fuel price adjustments. The fuel index price will be the monthly average posted price for the month of the bid letting.

2. Monthly Average Posted Price. The monthly fuel index prices will be determined by NYSDOT using the methods set forth in NYSDOT Standard Specification Section 698.

D. **Quantity**. The quantity of fuel in gallons considered for adjustment will be determined by invoices for fuel delivered to the Project site. Quantities of fuel will be measured to the nearest 0.01 gallon.

E. **Adjustment**. Fuel price adjustment will be based on the following formulas:

1. When price increases: Price Adjustment = (Quantity of Fuel) x (Monthly Average Posted Price - Fuel Index Price - $0.10)

2. When price decreases: Price Adjustment = (Quantity of Fuel) x (Monthly Average Posted Price - Fuel Index Price + $0.10)

F. **Payment of the Price Adjustment.** The Contractor is required to keep a log of all fuel incorporated into the Project that is eligible for the price adjustment. The log must keep track of the date when the fuel was purchased, the quantity of the fuel, the Fuel Index Price and the Monthly Average Posted Price, as determined in accordance with 1.6.C.

1. When the adjustment amount, calculated in accordance with 1.6.E, exceeds $10,000.00 for all eligible fuel delivered to the Project site, the Contractor must submit with its monthly payment requisition, the request for payment of the fuel price adjustment.

1.7 STEEL PRICE ADJUSTMENT

A. **Applicability**. The intent of the steel price adjustment is to cover steel materials as follows. For the purposes of this section, steel includes all steel alloys, stainless steel alloys, iron, and ductile iron.

1. Steel price adjustment will apply to groups of similar material content ("Material Groups") within a specification section (e.g., structural steel shapes under 05 21 00 – STRUCTURAL STEEL FRAMING or reinforcing bars under 03 20 00 – CONCRETE REINFORCING).

2. The steel price adjustment will apply to the following Material Groups:
   a. Structural steel and joists
   b. Reinforcing bars
   c. Steel deck pans
   d. Cold formed steel framing and trusses
   e. Stair stringers and pans
   f. Steel dunnage for equipment
   g. Steel piling
   h. Drainage, water, and electrical piping and tubing
   i. Steel doors
   j. Municipal steel and iron castings (manhole covers, sewer grates, etc.)

3. The steel price adjustment will not apply to the following:
   a. Steel in fabricated elements, such as HVAC chillers or electrical fixtures and boxes
   b. Handrails, access ladders, and other miscellaneous metals
   c. Anchor bolts and fasteners

B. For each Material Group listed, the Contractor must also identify the parties whose relationship establishes the invoice date. If the parties are known, they must be identified by name. If the two parties are not

known, they must be identified by role (Contractor, Subcontractor, Materialman, fabricator, etc.). Different parties may be identified for scopes within a Material Group for the purposes of establishing an invoice date. If the Contractor does not provide a list of materials to which to apply the steel price adjustment, no steel price adjustment will be made.

C. If the percentage change for a given month does not exceed 5% plus or minus, from the benchmark steel index, no adjustments will be made for materials invoiced that month.

D. The percentage change for each material group identified in Article 1.7.A.2 above will be determined using the month that the largest value of materials were invoiced.

E. The weight of the steel must exclude minor appurtenances individually weighing less than 5 lbs (i.e., nuts, bolts, washers, etc.) and non-steel components, such as door insulation or glazing. Precast or prestressed concrete items must have total reinforcing steel weight listed on the approved shop drawings. The following sources must be used, in declining order of precedence, to determine the weight of steel: approved shop drawings; verified shipping documents; Contract Documents; industry standards (i.e., AISC Manual of Steel Construction, AWWA Standards, etc.); and manufacturer's data.

1. **Indexes and Prices**. Adjustments are based on the Producer Price Index (PPI) for Semifinished Steel Mill Products (WPU 101702). PPI values are published by the US Department of Labor, Bureau of Labor Statistics (BLS). Recent PPI values are posted on the NYSDOT website linked above. The Cost Basis, Benchmark Steel Index, Monthly Steel Index, and the Percentage Change are defined as follows:

   a. **Cost Basis (CB).** An average price of steel products in dollars per ton used solely as a cost basis from which to compute steel price adjustments. The cost basis for original Contract bid price items and additional work at the original Contract bid price will be the cost basis listed for the month of the bid letting. The cost basis for additional work at agreed price will be the value of the cost basis for the month the agreed price was submitted to the Commissioner.
   b. **Benchmark Steel Index (BI).** The benchmark steel index for original Contract bid price items and additional work at the original Contract bid price will be the value of the preliminary PPI for the month of the bid letting. The benchmark steel index for additional work at agreed price will be the value of the preliminary PPI for the month the agreed price was submitted to the Commissioner.
   c. **Monthly Steel Index (MI)**. Value of the final PPI for the month the material is invoiced.
   d. **Percent Change**. The percent change in any given month will be determined as follows:

$$Percentage\ Change = \left(\frac{MI - BI}{BI} \right) x\ 100$$

F. The quantity of steel for adjustment of each Material Group will be measured to the nearest 0.1 tons.

1. **Percent Change Greater Than +5%**. If the Percentage Change is greater than +5% from the benchmark steel index, Price Adjustments will be made for materials invoiced that month. The Contractor must provide the Commissioner a detailed list of the weight of eligible materials within 60 calendar days after installation, including: the Contract pay item, the weight of steel, the month(s) of invoice, the source used to determine the weight, and if requested by the Commissioner, copies of invoices to verify the month of invoice.

2. **Percent Change -5% to +5%.** If the Percentage Change is between -5% and +5%, inclusive, from the benchmark steel index, no adjustments will be made for materials invoiced that month.

3. **Percent Change Lower Than -5%.** If the Percentage Change is lower than -5% from the benchmark steel index, a Price Adjustment will be charged to the Contractor for materials invoiced that month. The Contractor must provide the Commissioner a detailed list of the weight of eligible materials within 60 calendar days after installation, including: the Contract pay item, the weight of steel, the month(s) of invoice, the source used to determine the weight, and copies of invoices to verify the month of invoice.

G. **Adjustment.** Steel price adjustment will be made for all the materials which the Contractor opted to apply the steel price adjustment, based on the following formulas:

1. When price increases:

$$Price\ Adjustment = \left[\left(\frac{MI - BI}{BI}\right) - 0.05\right](CB)\,Qty$$

2. When price decreases:

$$Price\ Adjustment = -\left[\left(\frac{MI - BI}{BI}\right) + 0.05\right](CB)\,Qty$$

H. **Payment of the Price Adjustment.** Steel Price Adjustment will be paid once during the Project duration for each eligible Material Group after the final PPI is available to set the Monthly Steel Index for the invoice month determined in Article 1.7.D above.

1.8 MEASUREMENT AND PAYMENT

A. The fixed sum shown in the Bid Breakdown or Bid Schedule for Price Adjustments Allowance will be considered the price bid for this item. The fixed sum is not to be altered in any manner by the bidder. Should the amount shown be altered, the new figures will be disregarded and the original price will be used to determine the total amount bid for the Contract. The fixed sum payment made under this item will be equal to the sum of payments and credits for price adjustments, as approved by the Commissioner, with no markup for overhead, profit, or other fees allowed. The fixed sum amount is included in the bid solely to ensure that sufficient monies will be available to pay the Contractor for the price escalation adjustment payments as delineated herein, which may be more or less than the fixed sum amount.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 21 00.10

SECTION 01 21 00.20

EXPANDED WORK ALLOWANCE

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 21 00.20

PART I - GENERAL

1.1 PURPOSE

A. An Allowance has been established for the items set forth in sub-section 1.3 below ("Expanded Work Allowance" or "EWA"). Payment for the items set forth in sub-section 1.3 ("Expanded Work Items") may be made through the EWA, as directed by the Commissioner. "Extra Work", "overrun", and "Allowance" are defined by the Standard Construction Contract (see Articles 2.1.16, 26.1, and 2.1.4, respectively) and nothing in this Section alters, or will be deemed to alter the interpretation or application of, the Standard Construction Contract, including but not limited to Articles 25, 26, 28, and 78 of the Standard Construction Contract.

1.2 PROCESS

A. If the Commissioner determines that use of the EWA is appropriate, in their sole discretion, the Commissioner will prepare a written scope document for the Expanded Work Items for the Contractor's execution ("EWA Scope Memo"). The EWA Scope Memo will set forth the maximum amount payable from the EWA prior to the execution of a final cost memorandum ("Maximum Amount"), in accordance with this Section. The Maximum Amount may be increased from time to time by the Commissioner, in their sole discretion, except that the Maximum Amount may not exceed 80% of the Commissioner's estimated total cost for such Work (the "Estimated Cost") unless and until a final cost is determined and a final cost memorandum ("Final Cost Memo") executed in accordance with this Section.

B. Neither the Maximum Amount nor the Estimated Cost will be deemed to be the final cost of the Expanded Work Items. The final cost for the Expanded Work Items will be determined in accordance with Article 26 of the Standard Construction Contract. The Contractor must submit its detailed price proposal for the Expanded Work Items, calculated in accordance with the Contract, within the time period set forth in the EWA Scope Memo or within 90 Days after the executed EWA Scope Memo is issued to the Contractor, whichever is sooner.

C. Once the EWA Scope Memo is executed and the Contractor is directed to proceed with the Work, DDC will make progress payments, as provided in the Contract, up to the Maximum Amount or until the submission period has expired, whichever occurs sooner.

D. DDC will not make any progress payments for the performance of the Expanded Work Items beyond the submission period set forth in sub-Section C, above, unless and until a final cost has been determined and a Final Cost Memo executed in accordance with this Section. No amounts above the Maximum Amount set by the Commissioner will be payable from the EWA, unless and until a final cost has been determined and a Final Cost Memo executed in accordance with this Section. In all events, the Contractor shall promptly and diligently comply with the Commissioner's direction and perform all Work required by the Contract and the EWA Scope Memo.

E. Upon receipt of the Contractor's cost detailed proposal, DDC will evaluate the proposal and initiate negotiations, as necessary, to determine the final cost of the Expanded Work Items in accordance with Article 26 of the Standard Construction Contract. The Contractor is responsible to furnish time and material records in accordance with Article 28 of the Standard Construction Contract until a Final Cost Memo is executed. If the parties cannot agree on a unit price or fixed price, the Contractor will be paid on the basis of time and

material records in accordance with Article 26 the Standard Construction Contract.

F. A Final Cost Memo will be prepared by the Commissioner to be executed by the parties. The total net sum of the amounts added and/or credited under the EWA Scope Memo and payment of the finalized Final Cost Memo constitutes full accord and satisfaction for the costs resulting from the Expanded Work Items. In the event the EWA is insufficient to pay the full amount of the Final Cost Memo, the parties agree to execute change order documents for the remaining funds, subject to registration in accordance with the New York City Charter.

1.3 PRICE TO COVER

A. Expanded Work Items are those items set forth below. The EWA may be used, in the Commissioner's discretion, for the following Expanded Work Items:
   1. Non-material changes in the Work necessary to complete Contract Work due to site conditions that differ from those included in the Contract Documents and that could not have been anticipated by the Contractor.
   2. Non-material changes in the Work directed by the Commissioner that result in a net change in the cost to the Contractor for the Work to be performed under this Contract, including but not limited to the following:
      a. Overruns of unit price items and quantity increases in portions of work within a lump sum item.
      b. NYCDOT traffic stipulations or permit requirements that significantly differ from those included in the Contract Documents and that could not have been anticipated by the Contractor.
      c. Changes to the sizes of materials or changes to specifications of materials.
      d. Materials/structures not included in the Contract Documents that are necessary to complete Contract Work and that could not have been anticipated by the Contractor.

1.4 BASIS OF PAYMENT

A. The fixed sum must be considered the price bid for this item. The fixed sum is not to be altered in any manner by the bidder. Should the amount shown be altered, the new figures will be disregarded, and the original price will be used to determine the total amount bid for the contract.

B. The payment(s) made under this item will be equal to the Final Cost Memo prepared by the Commissioner and executed by the parties in accordance with 1.2(F) above as proof of work performed for this item as approved by the Commissioner.

C. The total estimated cost of this item is the "fixed sum" amount shown for this item in the Bid Submission Form and shall not be varied in the bid. The "fixed sum" amount is included in the bid solely to ensure that sufficient monies will be available to pay the Contractor for this work, which may be more or less than the fixed sum amount.

D. The price will cover the cost of all labor, materials, equipment, insurance, and incidentals necessary to complete the work under this section in accordance with the Contract Drawings, the specifications, and the directions of the Commissioner.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 21 00.20

SECTION 01 21 00.30

PROJECT WORK ACCELERATION ALLOWANCE

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 21 00.30

PART I - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) City of New York Standard Construction Contract.

1.2 SUMMARY

A. This Section includes:

1. Accelerated Project Work

1.3 INTENT

A. Under this Allowance, the Contractor will be paid for Work deemed necessary by the City to accelerate the Project work items during periods specified by the City. The use of this item will expire on the scheduled Substantial Completion date for the Project, or within the time to which such Substantial Completion date may be extended by the City.

B. Accelerated Project Work, as described below, will be paid for under this item in accordance with the requirements of Articles 25 and 26 of the City of New York Standard Construction Contract.

C. Payment made under this Allowance will cover the cost of all labor, materials, plant, equipment, insurance, and incidentals necessary to accelerate the Project Work as ordered by the Commissioner.

D. No guarantee is given that this Allowance will in fact be utilized in this Contract. The estimated allowance amount is included in the total bid solely to ensure a method of payment for any accelerated Project Work performed by the Contractor, when directed by the Commissioner.

1.4 ACCELERATED PROJECT WORK

A. The Accelerated Project Work Allowance may only be used to achieve a specific goal as directed by the Commissioner, such as reducing delays to the Project's critical path.

B. The Accelerated Project Work Allowance will not be utilized to accelerate the Project Work due to any delays caused by the Contractor. If the Project Work is delayed to Contractor's fault, the Contract must accelerate the Work at the Contractor's sole cost and expense.

C. The Commissioner will initiate all requests for Accelerated Project Work. The request will include the requested goal for the Accelerated Project Work.

1. The Contractor must prepare a Time Impact Analysis per the requirements of the applicable Project Schedules Section (01 32 16.10, 01 32 16.20, or 01 32 16.30) in order to determine the anticipated time savings for a specific use of Accelerated Project Work. The costs required for the Time Impact Analysis must be included in the prices bid for all work and will not be reimbursed under this Allowance.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 21 00.30

SECTION 01 25 00

SUBSTITUTION PROCEDURES

PART I GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:

1. Section 01 60 00 PRODUCT REQUIREMENTS for requirements for submitting comparable product submittals for products by named or unnamed manufacturers. (i.e., “or approved equal” products)

1.3 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor that are not required to meet other Project requirements but may offer advantage to Contractor. Substitutions for Convenience are not permitted.

B. A substitution is not an “or approved equal” or a product, material, equipment, or method of construction that meets the requirements of the Contract Documents. A substitution is a change to the Contract, which, upon approval, will result in a change order.

1.4 ACTION SUBMITTALS

A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use form acceptable to the Commissioner.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.

b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by others that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with applicable codes and standards.
j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Commissioner's Action: If necessary, Commissioner will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Commissioner will notify Contractor of acceptance or rejection of proposed substitution within 10 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order, Construction Change Directive, or Commissioner's Supplemental Instructions for minor changes in the Work.
b. Use product specified if Commissioner does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Substitutions: The Contractor must investigate and document compatibility of proposed substitution with related products and materials. The Contractor must engage a qualified testing agency to perform compatibility tests recommended by manufacturers or the Commissioner. These investigations, documentation, and testing will be at the Contractor’s sole expense.

1.6 PROCEDURES

A. Change Orders: A substitution is a Contractor-initiated change order request. Before a substitution can be implemented, it must pass through two approval processes: substitution approval per Article 1.7 below, and change order approval. If the substitution receives approval, as part of the change order process, the Contractor may request that the Commissioner consider granting advanced authorization.

B. Coordination during preparation of substitution: The Contractor, when developing a substitution, must address the designer's objectives, environmental permit requirements and regulations, commitments made to the public to mitigate the impact of construction, and other such concerns.

C. Coordination during execution of substitution: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

D. Conditions: The Contractor must not base any bid process on the anticipated approval of a substitution and should recognize that any substitution may be rejected. The following terms and conditions apply to a substitution:

1. A substitution will only be considered after the contract is awarded.

2. A substitution applies only to the contract for which it was submitted. One substitution must not be submitted for multiple contracts. Approval or disapproval of a substitution on one contract does not guarantee approval or disapproval on another contract.

3. The substitution request becomes the property of the City and will contain no restrictions imposed by the Contractor on its use or disclosure. The City will have the right to use, duplicate, and disclose in whole or in part any data necessary for the utilization of the substitution. The City retains the right to utilize any accepted or rejected substitution or part thereof on any other project without any obligation to the Contractor.

4. When the Commissioner is in the process of making design and specification revisions and a Contractor submits a substitution with similar revisions, the Commissioner will reject the substitution.

5. A substitution will be considered only if reasonable, cost-effective options are not provided in the Contract Documents.

6. The Commissioner will be the sole judge as to whether a substitution qualifies for consideration and evaluation. The Commissioner may reject any substitution that requires excessive time or costs for design review, evaluation, and/or investigations. The Commissioner will be the sole judge in determining if the proposed substitution will result in a sufficient amount of direct or indirect cost savings to offset the City's effort to review the substitution.

7. A substitution must be consistent with DDC's design policies and basic design criteria, provide the same service life or more, facilitate economy of operations, ease of maintenance, and achieve the desired appearance and safety.

8. The simple elimination of work does not necessarily constitute a substitution, however, a substitution which introduces a simple material substitution, or elimination of work, may be considered if it is accompanied by a design change or change in the construction method. A simple material substitution which introduces a new material to DDC may be also considered.

9. The substitution must not be experimental in nature but will have been proven to the Commissioner's satisfaction under similar or acceptable conditions on another City contract or at another location acceptable to the Commissioner.

10. If the Commissioner requires any additional information to evaluate the substitution, this information must be provided in a timely manner. Unless otherwise mutually agreed upon, failure to do so will result in the rejection of the substitution. An incomplete or a poor-quality substitution which hinders the Commissioner's review may also result in the rejection of the substitution.

11. The Contractor must allow submissions of substitution from an approved Subcontractor, provided that reimbursement is made by the City to the Contractor and that the terms of payment to the Subcontractor are satisfactorily negotiated and accepted before the substitution is submitted to the Commissioner. Subcontractors may not submit a substitution except through the Contractor.

12. A substitution approved by the Commissioner will be a revision to the Contract Documents and progress schedule. Consequently, if unsatisfactory results are being achieved or adjustments are necessary during implementation of a substitution, the rejection of work, removal of work, addition of work, or revision of work must be evaluated in accordance with the Contract requirements.

13. No work related to a substitution will be performed under allowance items. Agreed prices must be reached for the substitution before the substitution is approved. If the Contractor is deemed to have taken reasonable diligence in determining the work involved but if during the construction of substitution work a significant change in the character of work occurs, the Commissioner may consider new agreed prices.

14. The Contractor will receive written notification from the Commissioner when the substitution is approved. Material orders placed prior to substitution approval are placed at the Contractor's risk.

15. Once a substitution has been approved, the substitution will then be submitted as a change order and processed accordingly. The Contractor is responsible for submitting all appropriate information to the Commissioner in a timely manner.

1.7 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 30 days prior to time required for preparation and review of related submittals.

1. Conditions: Commissioner will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Commissioner will return requests without action, except to record noncompliance with these requirements:

   a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
   b. Substitution request is fully documented and properly submitted.
   c. Requested substitution will not adversely affect Contractor's construction schedule.
   d. Requested substitution has received necessary approvals of authorities having jurisdiction.
   e. Requested substitution is compatible with other portions of the Work.
   f. Requested substitution has been coordinated with other portions of the Work.
   g. Requested substitution provides specified warranty.
   h. If requested substitution involves more than one Subcontractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all Subcontractors involved.

B. Substitutions for Convenience: Not allowed.

PART II – PRODUCTS (Not Used)

PART III - EXECUTION (Not Used)

END OF SECTION 01 25 00

SECTION 012900

PAYMENT PROCEDURES

PART I - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract]

1.2 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process payment requisitions.

B. Related Requirements:

1. Sections 01 32 16.10, 01 32 16.20, or 01 32 16.30 PROJECT SCHEDULES (METHOD A/B/C) for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's payment requisitions. The Schedule of Values serves as the Bid Breakdown on Lump Sum per Article 41 of the Standard Construction Contract.

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's construction schedule per Sections 01 32 16.10, 01 32 16.20, or 01 32 16.30. If Section 01 32 16.30 is used and the Contractor’s Critical Path Method Schedule is cost loaded, it will serve as the Schedule of Values.

1. Coordinate line items in the Schedule of Values with items required to be indicated as separate activities in Contractor's construction schedule.
2. Submit the Schedule of Values to the Commissioner at earliest possible date and as required in Standard Construction Contract Article 41.1.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Arrange Schedule of Values consistent with format provided by the Commissioner.

2. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of payment request and progress reports. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.

3. Allowances and Unit Prices: Provide a separate line item in the Schedule of Values for each allowance and unit price item. Show line-item value of unit price items, as a product of the unit cost, multiplied by measured quantity.

4. Overhead Costs, Separate Line Items: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place, as separate line items.

5. Schedule of Values Revisions: Revise the Schedule of Values when Change Orders result in a change in the lump sum price. Include at least one separate line item for each Change Order.

1.5 PAYMENT REQUISITIONS

A. Each payment requisition following the initial mobilization payment requisition must be consistent with the previous requisitions and payments, as certified by the Commissioner. Each partial payment requisition must comply with the requirement of Article 42 of the Standard Construction Contract.

B. Payment Requisition Times: The Contractor must submit the payment requisition to the Commissioner by the end of the month following the payment period ("Due Date"). The period covered by each payment requisition is one month, ending on the last day of the month, unless a longer payment period is approved by the Commissioner.

1. The Contractor must submit a draft copy of the payment requisition seven days prior to Due Date for review by Commissioner.

C. Payment Requisition Forms: Use forms provided by the Commissioner as form for payment requisitions.

D. Payment Requisition Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Commissioner will return incomplete payment requisitions without action.

1. Entries shall match data on the Schedule of Values and Contractor's construction schedule. Use updated schedules if revisions were made.
2. Include amounts for work completed following previous payment requisition, whether or not payment has been received. Include only amounts for work completed at time of payment requisition.
3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by requisition.

E. PARTIAL PAYMENTS FOR MATERIALS IN ADVANCE OF THEIR INCORPORATION IN THE WORK PURSUANT TO ARTICLE 42 OF THE CONTRACT – In order to better ensure the availability of materials, fixtures and equipment when needed for the work, the Commissioner may authorize partial payment for certain materials, fixtures and equipment, prior to their incorporation in the work, but only in strict accordance with, and subject to, all the terms and conditions set forth in the Specifications, unless an alternate method of payment is elsewhere provided in the Specifications for specified materials, fixtures or equipment.

1. The Contractor must submit to the Commissioner a written request, in quadruplicate, for payment for materials purchased or to be purchased for which the Contractor needs to be paid prior to their actual

incorporation in the work. The request must be accompanied by a schedule of the types and quantities of materials, and must state whether such materials are to be stored on or off the site.

2. Where the materials are to be stored off the site, they must be stored at a place within the continental United States other than the Contractor's premises (except with the written consent of the Commissioner) and under the conditions prescribed or approved by the Commissioner. The Contractor must set apart and separately store at the place or places of storage all materials and must clearly mark same "PROPERTY OF THE CITY OF NEW YORK", and further, must not at any time move any of said materials to another off-site place of storage without the prior written consent of the Commissioner. Materials may be removed from their place of storage off the site for incorporation in the work upon approval of the Commissioner.

3. Where the materials are to be stored at the site, they must be stored at such locations as will be designated by the Commissioner and only in such quantities as, in the opinion of the Commissioner, will not interfere with the proper performance of the Work by the Contractor or by other Subcontractors then engaged in performing work on the site. Such materials must not be removed from their place of storage on the site except for incorporation in the Work, without the approval of the Commissioner.

4. INSURANCE

   a. STORAGE OFF-SITE – Where the materials are stored off the site and until such time as they are incorporated in the Work, the Contractor must fully insure such materials against any and all risks of destruction, damage or loss including but not limited to fire, theft, and any other casualty or happening. The policy of insurance must be payable to the City of New York. It must be in such terms and amounts as must be approved by the Commissioner and must be placed with a company duly licensed to do business in the State of New York. The Contractor must deliver the original and one (1) copy of such policy or policies marked "Fully Paid" to the Commissioner.

   b. STORAGE ON THE SITE – Where the materials are stored at the site, the Contractor must furnish satisfactory evidence to the Commissioner that they are properly insured against loss, by endorsements or otherwise, under the policy or policies of insurance obtained by the Contractor to cover losses to materials owned or installed by the Contractor. The policy of insurance must cover fire and extended coverage against windstorm, hail, explosion and riot attending a strike, civil commotion, aircraft, vehicles and smoke.

5. All costs, charges and expenses arising out of the storage of such materials, must be paid by the Contractor and the City hereby reserves the right to retain out of any partial or final payment made under the Contract an amount sufficient to cover such costs, charges and expenses with the understanding that the City will have and may exercise any and all other remedies at law for the recovery of such cost, charges and expenses. There will be no increase in the Contract price for such costs, charges and expenses and the Contractor must not make any claim or demand for compensation therefore.

6. The Contractor must pay any and all costs of handling and delivery of materials, to the place of storage and from the place of storage to the site of the Work; and the City will have the right to retain from any partial or final payment an amount sufficient to cover the cost of such handling and delivery.

7. In the event that the whole or any part of these materials are lost, damaged, or destroyed in advance of their satisfactory incorporation in the work, the Contractor, at the Contractor's own cost, must replace such lost, damaged or destroyed materials of the same character and quality. The City will

reimburse the Contractor for the cost of the replaced materials to the extent, and only to the extent, of the funds actually received by the City under the policies of insurance hereinbefore referred to. Until such time as the materials are replaced, the City will deduct from the value of the stored materials or from any other money due under the Contract, the amount paid to the Contractor for such lost, damaged or destroyed materials.

8. Should any of the materials paid for the City hereunder be subsequently rejected or incorporated in the work in a manner or by a method not in accordance with the Contract Documents, the Contractor must remove and replace, at Contractor's own cost, such defective or improperly incorporated material with materials complying with the Contract Documents. Until such materials are replaced, the City will deduct from the value of the stored materials or from any other money due to the Contractor, the amount paid by the City for such rejected or improperly incorporated materials.

9. Payments for the cost of materials made hereunder will not be deemed to be an acceptance of such materials as being in accordance with the Contract Documents, and the Contractor always retains and must comply with the Contractor's duty to deliver to the site and properly incorporate in the work only materials which comply with the Contract Documents.

10. The Contractor must retain any and all risks in connection with the damage, destruction, or loss of the materials paid for hereunder to the time of delivery of the same to the site of the Work and their proper incorporation in the work in accordance with the Contract Documents.

11. The Contractor must comply with all laws and the regulations of any governmental body or agency pertaining to the priority purchase, allocation, and use of the materials.

12. When requesting payment for such materials, the Contractor must submit with the partial estimate duly authenticated documents of title, such as bills of sale, invoices or warehouse receipts, all in quadruplicate. The executed bills of sale must transfer title to the materials from the Contractor to the City. (In the event that the invoices state that the material has been purchased by a Subcontractor, bills of sale in quadruplicate will also be required transferring title to the materials from Subcontractor to the Contractor).

13. Where the Contractor, with the approval of the Commissioner, has purchased unusually large quantities of materials in order to assure their availability for the work, the Commissioner, at the Commissioner's option, may waive the requirements of Paragraph 12 provided the Contractor furnishes evidence in the form of an affidavit from the Contractor in quadruplicate, and such other proof as the Commissioner may require, that the Contractor is the sole owner of such materials and has purchased them free and clear of all liens and other encumbrances. In such event, the Contractor will pay for such materials and submit proof thereof, in the same manner as provided in Paragraph 12 hereof, within seven (7) days after receipt of payment therefore from the Comptroller. Failure on the part of the Contractor to submit satisfactory evidence that all such materials have been paid for in full, will preclude the Contractor from payments under the Contract.

14. The Contractor must include in each succeeding partial estimate requisition a summary of materials stored which must set forth the quantity and value of materials in storage, on or off the site, at the end of each preceding estimate period; the amount removed for incorporation in the Work; the quantity and value of materials delivered during the current period and the total value of materials on hand for which payment thereof will be included in the current payment estimate.

15. Upon proof to the satisfaction of the Commissioner of the actual cost of such materials and upon submission of proper proof of title as required under Paragraph 12 or Paragraph 13 hereof, payment will be made therefore to the extent of 85%, provided however, that the cost so verified, established

and approved must not exceed the estimated cost of such materials included in the approved detailed breakdown estimate submitted in accordance with Article 41 of the Contract; if it does, the City will pay only 85% approved estimated cost.

16. Upon the incorporation in the Work of any such materials, which have been paid for in advance of such incorporation in accordance with the foregoing provisions, payment will be made for such materials incorporated in the Work pursuant to Article 42 of the Contract, less any sums paid pursuant to Paragraph 15 herein.

F. Transmittal: Submit one signed and notarized electronic PDF copy of each payment requisition to Commissioner by email or as directed.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. MOBILIZATION PAYMENT – A line item for mobilization must be allowed on the Contractor's Detailed Bid Breakdown submitted in accordance with Article 41 of the Contract. The Mobilization Payments are intended to include the cost of required bonds, insurance coverage, and/or any other expenses required for the initiation of the Contract Work. All costs for mobilization will be deemed included in the total Contract Price. The Detailed Bid Breakdown must reflect, and the Mobilization Payment will be made, in accordance with the following schedule:

Contract Bid Amount	Initial Mobilization Payment	Remaining Mobilization Payment	Total Mobilization Payment (Initial Mobilization Payment + Remaining Mobilization Payment)
$0 - $10,000,000	1% of contract bid amount	7% of contract bid amount	8% of contract amount
$10,000,001 - $50,000,000	1% of contract bid amount	7% on the first $10,000,000 plus 3% of the contract bid amount greater than $10,000,000	8% on the first $10,000,000 plus 4% of contract amount greater than $10,000,000
Over $50,000,000	$500,000	$1,900,000	$2,400,000

1. Upon issuance of the Notice to Proceed, the Contractor may requisition for the Initial Mobilization Payment upon submission and approval of all required insurance certificates and bonds.

2. The Contractor may requisition for the Remaining Mobilization Payment upon satisfactory completion of the following items:

a. DDC approval of the Detailed Bid Breakdown per Article 41 of the Contract;

b. Selection and DDC approval of any required field office location(s);

c. Submission of all required insurance certificates and bond;

d. Approval of the Site Safety Plan per the Safety Requirements Section of the Information for Bidders;

e. Approval of the Progress Schedule;

f. Approval of the Schedule Submittal; and,

g. Submission of the Pre-Construction Photographs.

3. The Contractor will not be entitled to a Mobilization Payment that exceeds the Total Mobilization Payment specified in the chart above for the applicable Contract Bid Amount.

H. PAYMENT OF ALLOWANCES:

1. Unless otherwise called for in the Specifications, the following requirements apply to the payment and execution of Allowances established in the Contract:

a. Allowances are to be utilized when ordered and authorized in writing by the Commissioner.

b. The Contractor will be paid on a time and materials (T&M) basis under the Allowance, in accordance with the requirements of Standard Construction Contract Article 26.

I. Payment Requisition at Substantial Completion: Requestion for Substantial Completion Payment must be submitted in accordance with Article 44 of the Contract.

1. After Commissioner issues the Certificate of Substantial Completion, submit a payment requisition for Substantial Completion payment in compliance with Article 44 of the Contract.

2. Include documentation supporting that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.

a. Complete administrative actions, submittals, and Work for Substantial Completion, as described in Section 01 77 00 CLOSEOUT PROCEDURES.

3. This payment requisition must reflect any Occupation or Use Prior to Completion per Article 16 of the Standard Construction Contract.

J. Final Payment Application: After completing Project closeout requirements, submit a payment requisition for Final Acceptance payment in compliance with Article 45 of the Contract.

1.6 PAYMENTS TO M/WBE SUBCONTRACTORS

A. The Department of Design and Construction ("DDC") is committed to supporting the growth and success of Minority and Women-owned Business Enterprises ("M/WBE"). In furtherance of this goal, DDC complies with NYC Administrative Code section 6-129, as amended. In order to support the growth and success of M/WBEs on all DDC projects, it is important that M/WBE vendors that are sub-contractors (any tiers) are treated fairly at all times and that their payment requisitions / invoices are handled in accordance with the City's Standard Construction Contract. Pursuant to the Standard Construction Contract, prime contractors are required to pay Subcontractors within thirty (30) days of receipt of such funds from DDC. Failure to comply with the Standard Construction Contract and the goals established by DDC as it applies to M/WBEs, may result in financial sanctions and negative performance evaluations, which will be taken into consideration on future procurements.

PART II - PRODUCTS (Not Used)

PART III - EXECUTION (Not Used)

END OF SECTION 01 29 00

SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. LEED: Refer to the Addendum to identify whether this Project is designed to comply with a Certification Level according to the U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) Rating System, as specified in Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.

C. COMMISSIONING: Refer to the Addendum to identify whether this Project will be commissioned by an independent third party under separate contract with the City of New York (City). Commissioning will be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS, and/ or Section 01 91 15 GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE COMMISSIONING. The Contractor must cooperate with the commissioning agent and provide whatever assistance is required.

1.2 SUMMARY:

A. This Section includes administrative provisions for coordinating construction operations on the Project, including:

1. Coordination Drawings
2. Administrative and supervisory personnel
3. Project meetings
4. Requests for Interpretation (RFIs)

B. This Section includes the following:

1. Definitions
2. Coordination
3. Submittals
4. Project Meetings
5. Requests for Interpretation (RFI's)
6. Correspondence
7. Contractor's Daily Reports

C. Related Sections:

1. Section 01 10 00 SUMMARY
2. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
3. Section 01 33 00 SUBMITTALS
4. Section 01 35 26 SAFETY REQUIREMENTS
5. Section 01 73 00 EXECUTION REQUIREMENTS
6. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
7. Section 01 77 00 CLOSEOUT PROCEDURES

1.3 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" must mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.4 COORDINATION:

A. Coordination: The Contractor must coordinate its construction operations, including those of its Subcontractors, with other entities to ensure the efficient and orderly installation of each part of the Work. The Contractor must coordinate the various operations required by different Sections of the Specifications that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence in order to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum access for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and access for required maintenance, service, and repair of all components, including mechanical and electrical.

B. The Contractor must prepare memoranda for distribution to its Subcontractors and other involved entities, outlining special procedures required for coordination. Such memoranda must include required notices, reports, and meeting minutes as applicable.

C. Administrative Procedures: The Contractor must coordinate scheduling and timing of required administrative procedures with other construction activities and activities of its Subcontractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include without limitation the following:

1. Preparation of Contractor's Construction Schedule.
2. Installation and removal of temporary facilities and controls.
3. Delivery and processing of submittals.
4. Progress meetings.
5. Pre-installation conferences.
6. Startup and adjustment of systems.
7. Project closeout activities.

D. Conservation: The Contractor must coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

E. Salvaged Items, Material and/or Equipment: The Specifications may identify certain items, materials or equipment which must be salvaged by the Contractor and handled or disposed of as directed. The Contractor must comply with all directions in the Specifications regarding the salvaging and handling of identified items, material or equipment.

F. Software: The Contractor may be required by the Commissioner to utilize a designated cloud-based Construction Management Tool to streamline and manage activities, including but not limited to the following:
   1. Submittals;
   2. Drawings, Specifications, and Bulletins;
   3. RFI's;
   4. Progress Photographs;
   5. Letters and Correspondence;
   6. Punchlists and Closeout Management;
   7. Daily Logs;
   8. Meetings and Minutes; and/or,
   9. Change Order log memos.

1.5 SUBMITTALS:

A. Submit shop drawings, product data, samples etc., in compliance with Section 01 33 00 SUBMITTAL PROCEDURES.

B. Coordination Drawings: The Contractor must prepare applicable Coordination Drawings in compliance with the requirements for Coordination Drawings in Section 01 33 00 SUBMITTAL PROCEDURES.

C. Safety Plan in compliance with Section 01 35 26 SAFETY REQUIREMENTS PROCEDURES.

D. Waste Management Plan in compliance with Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

E. Key Personnel Names: Within fifteen (15) Days after the Notice to Proceed (NTP), the Contractor must submit a list of key personnel assignments of the Contractor and its Subcontractors, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in case of the absence of individuals assigned to Project.

   1. Post copies of the list in Project meeting room, in temporary field office, and by each temporary telephone. Keep the list current at all times.

   2. In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work. Include special personnel required for coordinating all operations by its Subcontractors.

1.6 PROJECT MEETINGS:

A. General: The Commissioner will hold regularly scheduled construction progress meetings at the site, at which time the Contractor and appropriate Subcontractors must have their representatives present to discuss all details relative to the execution of the work. The Commissioner will preside over these meetings.

   1. Agenda: Prior to each meeting, the Commissioner will consult with the Contractor and will prepare an agenda of items to be discussed. In general, after informal discussion of any item on the agenda, the Commissioner will summarize the discussion in a brief written statement, and the Contractor will then dictate a brief statement for the record.

   2. Coordination: In addition to construction progress meetings called by the Commissioner, the Contractor must hold regularly scheduled meetings for the purpose of coordinating, expediting and scheduling the work in accordance with the master coordinated Job Progress Chart. The Contractor and its Subcontractors, material suppliers or vendors whose presence is necessary, are required

to attend. These meetings may, at the discretion of the Contractor, be held at the same place and immediately following the Project meetings held by the Commissioner. Minutes of these meetings must be recorded, typed and printed by the Contractor and distributed to all parties concerned.

B. Preconstruction Kick-Off Meeting:

1. The Commissioner will schedule a preconstruction kick-off meeting either at DDC's main office or at the Project site to review responsibilities and personnel assignments and clarify the role of each participant. Unless otherwise directed, the Design Consultant will record and distribute meeting minutes.
2. Attendees: Authorized representative of the Sponsor Agency; Design Consultant; the Contractor and its superintendents, Subcontractor(s) and their superintendent(s); LEED sub-consultant and Commissioning Authority /Agent (CxA) as applicable and other concerned parties. All participants at the meeting must be familiar with the Project and authorized to conclude matters relating to the Contract Work.
3. Agenda: Includes without limitation the following as applicable:
   a. Establishing construction schedule;
   b. Schedule for regular construction meetings;
   c. Phasing;
   d. Critical Work sequencing and long-lead items;
   e. Designation of key personnel and their duties;
   f. Reviewing application for payment and change order procedures;
   g. Procedures for RFIs;
   h. Review permits and approval requirements;
   i. Review all recent administrative code reporting requirements relating to the Project, (i.e. LL 77, LL86 etc.);
   j. Procedures for testing and inspecting;
   k. Reviewing special conditions at the Project site;
   l. Distribution of the Contract Documents;
   m. Submittal procedures;
   n. Safety procedures;
   o. LEED requirements;
   p. Commissioning requirements;
   q. Preparation of record documents;
   r. Historic Treatment requirements;
   s. Use of the premises;
   t. Work restrictions;
   u. Sponsor Agency occupancy requirements;
   v. Responsibility for temporary facilities, services, and controls;
   w. Construction Waste Management and Disposal;
   x. Indoor Air Quality Management Plan;
   y. Dust Mitigation Plan;
   z. Office, work, and storage areas;
   aa. Equipment deliveries and priorities;
   bb. Security;

cc. Progress cleaning; and,

dd. Working hours;

C. Construction Progress Meetings:

1. The Commissioner will schedule and conduct construction progress meetings at bi-weekly intervals or as otherwise determined. All participants at the meeting must be familiar with the Project and authorized to conclude matters relating to the Work. Unless otherwise directed, the Design Consultant will record and distribute meeting minutes.
2. Attendees:
   a. Design Consultant and applicable sub-consultants;
   b. Sponsor Agency Representative;
   c. Representatives from the Contractor, sub-contractor(s), suppliers or other entities involved in the current progress, planning, coordination or future activities of the Work; and,
   d. Other appropriate DDC personnel, DDC consultants and concerned parties.
3. Agenda: Includes without limitation the following:
   a. Review the Construction Schedule and progress of the Work. Determine if the Work is on time, ahead of schedule or behind schedule. Determine actions to be taken to maintain or accelerate the schedule;
   b. Review and approve prior meeting minutes and follow up open issues;
   c. Coordinate work between each Subcontractor;
   d. Sequence of Operations;
   e. Status of submittals, deliveries, and off-site fabrication;
   f. Status of inspections and approvals by governing agencies;
   g. Temporary facilities and controls;
   h. Review Site Safety;
   i. Quality and work standards;
   j. Field observations;
   k. Status of correction of deficient items;
   l. RFI's;
   m. Pending changes;
   n. Status of outstanding payments and change orders;
   o. LEED requirements including Construction Waste Management, Indoor Air Quality Plan, Dust Mitigation and Commissioning; and,
   p. Status of Administrative Code reporting requirements related to the Project.

D. Preinstallation Conferences:

1. The Contractor will conduct a preinstallation conference at project site before each construction activity when required by other specification Sections and when required for coordination with other construction.
2. Attendees:
   a. Contractor and its superintendents
   b. Applicable Subcontractor(s)
   c. Representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will

follow.

3. Advise the Commissioner of scheduled preinstallation conference meeting dates.
4. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
   a. Contract Documents
   b. Related RFI's
   c. Deliveries
   d. Submittals
   e. Review of mockups
   f. Possible conflicts
   g. Compatibility requirements
   h. Time schedules
   i. Weather limitations
   j. Manufacturer's written instructions
   k. Warranty requirements
   l. Compatibility of materials
   m. Acceptability of substrates
   n. Temporary facilities and controls
   o. Space and access limitations
   p. Testing and inspecting requirements
   q. Installation procedures
   r. Coordination with other work
   s. Required performance results
   t. Protection of adjacent work

1.7 REQUESTS FOR INFORMATION (RFI):

A. Procedure: Immediately on discovery of the need for information or interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, the Contractor must prepare and submit an RFI in the form specified by the Commissioner.

1. RFI must originate with the Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
2. Coordinate and submit RFI in a prompt manner to the Commissioner so as to avoid delays in Contractor's Work or Work of its Subcontractors.
3. RFI Log: The Contractor must prepare, maintain, and submit a tabular log of RFIs organized by the RFI number monthly to the Commissioner, or more frequently if directed by the Commissioner.
4. On receipt of responses and action to the RFI, the Contractor must update the RFI log and immediately distribute the RFI response to affected parties. Review response(s) and notify the Commissioner immediately if the Contractor disagrees with response(s).

1.8 CORRESPONDENCE:

A. Copies of all correspondence to DDC must be sent directly to the Commissioner at the job site.

1.9 CONTRACTOR'S DAILY REPORTS:

A. The Contractor must prepare and submit Daily Construction Progress Reports as outlined in Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 31 00

SECTION 01 32 00
CONSTRUCTION PROGRESS DOCUMENTATION

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required Work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for establishing an effective base line schedule for the Project and documenting the progress of construction during performance of the Work by developing and revising as necessary, various documents including but not limited to the following:
1. Submittals schedule
2. Daily construction reports
3. Material location reports
4. Field condition reports
5. Special reports

B. RELATED SECTIONS:

1.	Section 01 10 00	SUMMARY
2.	Section 01 32 22	PHOTOGRAPHIC DOCUMENTATION
3.	Section 01 32 16.10	PROJECT SCHEDULES (METHOD A)
4.	Section 01 32 16.20	PROJECT SCHEDULES (METHOD B)
5.	Section 01 32 16.30	PROJECT SCHEDULES (METHOD C)
6.	Section 01 33 00	SUBMITTAL PROCEDURES
7.	Section 01 40 00	QUALITY REQUIREMENTS

1.3 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: “Design Consultant” must mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the “Design Consultant” may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

PART II – PRODUCTS

2.1 SUBMITTALS SCHEDULE:

A. Preparation: The Contractor must submit a schedule of submittals, arranged in chronological order by dates required by the construction schedule. Include time required for review, re-submittal, ordering, manufacturing, fabrication, and delivery when establishing dates. The Submittals Schedule must show all of the following types of submittals:

1. Shop and Coordination Drawings
2. Material Samples
3. Catalog Cuts
4. Test and Evaluation Reports
5. Field Test Reports
6. Sample Warranties
7. Certificates
8. Qualification Data
9. Closeout Submittals

B. Submittals: At the kick-off meeting, the Contractor must have a preliminary Submittals Schedule, and must review this Schedule with the Commissioner. Within ten (10) Days after the kick-off meeting, the Contractor must complete the Submittals Schedule, including all submission dates, required delivery dates, and fabrication times. The Contractor must include an updated Submittals Schedule with all Progress Payment applications.

C. Review: The Commissioner will review the Submittals Schedule submitted by the Contractor. Upon acceptance, the Commissioner will date and sign the schedule as approved and transmit it to the Design Consultant, Contractor, and others within DDC as the Commissioner deems appropriate. If so directed by the Commissioner, the Contractor must revise the Submittals Schedule to indicate a submission date for specified shop drawings and/or material samples within sixty (60) Days after the kick-off meeting. The Contractor must resubmit the Submittals Schedule as necessary to include all review comments.

2.2 REPORTS:

A. Daily Construction Reports: The Contractor must submit to the Commissioner written Daily Construction Reports at the end of each day that work was performed, recording basic information such as the date, day, weather conditions, and contract days passed, remaining contract duration/days and the following information concerning the Project.

Information: The reports must be prepared by the Contractor's Superintendent and must bear the Contractor's Superintendent's signature. Each report must contain the following information:

1. List name of Contractor, Subcontractors, their work force in each category, and details of activities performed;
2. The type of materials and/or major equipment being installed by the Contractor and/or by each Subcontractor;
3. The major construction equipment being used by the Contractor and/or Subcontractors;
4. Material and Equipment deliveries;
5. High and low temperatures and general weather conditions;
6. Accidents;
7. Meetings and significant decisions;
8. Unusual events;
9. Stoppages, delays, shortages, and losses;
10. Meter readings and similar recordings;
11. Emergency procedures;

12. Orders and/or requests of authorities having jurisdiction;
13. Approved Change Orders received and implemented;
14. Field Orders and Directives received and implemented;
15. Services connected and disconnected;
16. Equipment or system tests and startups;
17. Digital photographs (cell phone quality, 5 megapixel minimum) of the work being performed, and of any issues;
18. Partial Completion(s) and occupancies; and,
19. Substantial Completion(s) authorized;

NOTE: If there is NO ACTIVITY at site, a daily report indicating so and the reason for no activity at the site must be submitted.

B. Material Location Reports: The Contractor must submit a Material Location Report at weekly OR monthly intervals as determined and established by the Commissioner. Such report must include a comprehensive list of materials delivered to and stored at Project site. List must be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit a Request For Information (RFI) form with a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.3 SPECIAL REPORTS:

A. Accident report, incident report, special condition report for the conditions out of control of any party involved with the Project effecting Project progress, explaining impact on the Project schedule and cost if any.

PART III – EXECUTION (Not Used)

END OF SECTION 01 32 00

SECTION 01 32 16.10
PROJECT SCHEDULES (METHOD A)

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 32 16.10

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes the following:

1. Methods
2. Definitions
3. Preliminary, Baseline, and Project Schedule Preparation Timeline
4. Preliminary Project Schedule Development
5. Project Schedule
6. Activity and Calendar Coding Structure
7. Work Breakdown Structure (WBS)
8. Major Milestones
9. Short (Three-Week) Interval/Two-Week Look-Ahead
10. Submittals
11. Project Schedule Updating
12. Time Impact Analysis

1.3 METHODS:

A. The Contractor must comply with Project schedule development and updating requirements as specified herein.

1. The Contractor must employ or retain the services of a Construction Scheduler with verifiable construction scheduling experience, subject to review and acceptance by the City. Upon request, the Contractor must provide the City with details of qualifications and experience of the proposed scheduling staff member(s).

2. The Contractor must prepare, update, and maintain a detailed Project Schedule using a version of scheduling software that is compatible with the City's Oracle Primavera P6 Enterprise Project Portfolio Management (EPPM). All schedule submittals must be developed using Oracle's Primavera P6 EPPM software. Schedules must be developed using accepted CPM techniques using the precedence diagramming method (PDM). The Project Schedule must be developed following Defense Contract Management Agency (DCMA) and American Association of Cost Engineering International (AACE International) guidance. The Contractor will be required to use the Contractor's

own P6 license (whether single-user or Enterprise license), unless otherwise directed by the Commissioner. If directed by the Commissioner prior to the Notice to Proceed (NTP), the Contractor must use the Department's P6 Enterprise license and develop the Progress Schedule within the Department's Enterprise environment.

3. Once the Baseline Schedule is accepted by the City, progress updates to the Project Schedule must be submitted monthly, unless otherwise directed by the City, until Substantial Completion. The Data Date for the schedule updates must use the last Friday of the month, or as directed by the City.

4. The Contractor will be responsible for providing the monthly schedule updates once the Baseline Schedule is approved. Each monthly schedule update must be accompanied with a schedule narrative that explains the following:

   a. The progress of work during that particular period of performance,
   b. Any changes in schedule Logic,
   c. The physical conditions that were used to update every Activities Percent Complete,
   d. Any change in actual Start and Finish Dates,
   e. Any Duration changes,
   f. Any added and deleted Activities, and
   g. Any added Extra Work (e.g. change orders).

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Term	**Definition**
Activity	A representation of a discrete portion of the overall scope of Work or an event through Duration and description in a CPM schedule.
Baseline Schedule	The planned and detailed CPM schedule of Activities, including all Logic, Durations, Resource and Cost Loading, and showing the entire scope of Work. The Baseline Schedule must be accepted by the City.
Critical Path	The longest sequence of Activities in a network which establishes the minimum length of time for accomplishment of the end event of the Project.
Critical Path Method (CPM)	A management technique used to plan and control a Project which combines all relevant information into a single plan defining the sequence and Duration of operations and depicting the interrelationship of the Work elements required to complete the Project.
Current Schedule	The most recently updated schedule that captures progress to date and forecasts the dates for each Activity.
Data Date	The date used as a starting point for scheduling calculations. The Data Date is changed to the current end of period date when a schedule is updated for progress.
Duration	The amount of time, in workdays, an Activity will take to perform.

Term	Definition
Finish Date	The earliest estimated date an Activity is calculated to be complete, based on the estimated performance of all prior Activities to which the Activity is logically connected in a progressive relationship.
Free Float	The calculated amount of time that the estimated start or finish of an Activity can be delayed without impacting the start or finish of other downstream Activities logically connected in a progressive relationship. (See Finish Date and Late Finish).
Fragnet	Fragmentary network: a portion of a schedule detailing impacts of an event on specific Activities in the broader schedule.
Inclement Weather	Any weather condition, the duration of which varies in excess of the 3-year average published by the National Oceanic and Atmospheric Administration (NOAA) information for the local area.
Integrated Project Schedule	The Commissioner's overall schedule covering design, procurement and construction. The Commissioner will use the Contractor's Project Schedule to update the Integrated Project Schedule.
Late Finish	An estimate of the latest plausible date an Activity's completion can be postponed without rendering as unachievable the required completion of any downstream Milestones to which the Activity is Logically connected to in a progressive relationship.
Late Start	An estimate of the latest plausible date an Activity's start can be postponed without rendering as unachievable the required completion of any downstream Milestones to which the Activity is Logically connected to in a progressive relationship.
Logic	A direct progressive relationship between Activities where one Activity's performance restricts the performance of another Activity.
Milestone	A key or critical point in time for reference or measurement.
Network Diagram	A graphic diagram of a network schedule, showing Activities and Activity relationships.
Original Duration	The estimated amount of time, in Work Days, an Activity is expected to take to complete at the beginning of a Project as anticipated by the Contractor based on its planned means and methods at time of bid and documented in the Baseline Schedule.
Percent Complete	The percentage of the scope of Work represented by an Activity completed as of the Data Date calculated as physical percent complete for payment purposes.
Project Schedule	The Contractor's schedule used to manage the orderly and expeditious completion of the Work. The Project Schedule is initially the accepted Baseline Schedule, and is updated throughout the Project.
Remaining Duration	The amount of time, in Work Days, the remaining scope of Work represented by an Activity is expected to take to complete, measured from the current Data Date.

Term	Definition
Resource and Cost Loading	Values assigned for estimated dollars, manpower, equipment and/or materials necessary to complete the scope of Work represented by a specific Activity.
Recovery Schedule	A Recovery Schedule outlining and incorporating extraordinary efforts required to recover lost time with the aim of achieving completion of the Project within the stipulated contract Duration, plus authorized time extensions. In such case, special attention must be given to minimize delays as much as possible and must establish the nature of efforts; for instance, resources and equipment required, extended hours of work, weekend work, accelerated fabrication, required action(s) or effort(s) by the Contractor, its Subcontractors, consultants, clients, end users and/or other concerned parties to recover the schedule.
Revised and/or Updated Schedule	A Baseline Schedule, Progress Project Schedule, or Recovery Schedule for the Project that shows the actual Duration of all the completed Activities, including Duration of and the reasons for delays, if any has occurred, AND revisions to all remaining Activities of the Contractor and its Subcontractors, including changes, if any, to logical ties, interrelations and the sequence of each of the outlined Activities. Any such revisions should be shown on the row just below the approved schedule of the respective Activity so that revisions can be compared. The Revised and/or updated Schedule must be reviewed and approved by the City.
Start Date	The earliest estimated date an Activity is calculated to begin, based on the estimated performance of all prior Activities to which the Activity is logically connected in a progressive relationship.
Time Impact Analysis	A forward looking (prospective) schedule analysis used to forecast the impact to the Critical Path and to Milestone Finish Dates caused by a single event or series of events. Time Impact Analysis is not a retrospective (forensic) schedule analysis or a what-if schedule analysis of a potential event.
Total Float	The amount of time the start or finish of an Activity can be delayed without affecting the Project completion date.
Work Breakdown Structure (WBS)	WBS is a deliverable-oriented decomposition of a Project into smaller components. A WBS provides the necessary framework for detailed cost estimating and control along with providing guidance for schedule development and control.
Work Days (WD)	Work Days are every consecutive day in the calendar, excluding weekends (Saturday and Sunday) and holidays.

1.5 PRELIMINARY, BASELINE, AND PROJECT SCHEDULE PREPARATION TIMELINE:

A. Upon receipt of the NTP, the Contractor must promptly prepare a preliminary Project Schedule and subsequently a Baseline Schedule and must submit for the City's acceptance as follows:

1. The preliminary Project Schedule must be submitted no later than fifteen (15) Days after NTP.
2. The initial submittal of the Baseline Schedule must be provided to the City for review no later than thirty (30) Days after NTP.

3. The Contractor must incorporate all corrections and revisions required by the City and provide an updated version of the Baseline Schedule for review and acceptance no later than sixty (60) Days after NTP to ensure that the Baseline Schedule is accepted. The sixty (60) Days must include fourteen (14) Days review times for each submittal of the Baseline Schedule.
4. Once accepted, the Baseline Schedule will be the basis of Project Schedule updates.

1.6 PRELIMINARY PROJECT SCHEDULE DEVELOPMENT:

A. The preliminary Project Schedule must be a detailed plan (division level per Construction Specifications Institute (CSI) MasterFormat) of all operations, including submittals, permitting, testing, and construction Activities, for either the first ninety (90) Days after NTP or to the point where the Contractor plans to mobilize on site (whichever is greater). This submittal will also depict a summary level (section level per CSI MasterFormat) schedule of the major Activities for the remainder of the Work.

1. All Activities for Contractor mobilization, procurement, and construction Activities within the first sixty (60) Days, including permits and submittals. All remaining work forecasted after the first sixty (60) Days must be summarized through the Contract's completion date.
2. All submittal and procurement Activities for long lead items.
3. The Project's Critical Path.
4. An electronic copy of the schedule in either MS Project (.MPP) or Primavera P6 Professional Format (.XER).

B. The preliminary Project Schedule will be reviewed by the City and returned with comments, as necessary, within fourteen (14) Days of submittal receipt. Information from the preliminary Project Schedule will be the general foundation for development of the Baseline Schedule.

1.7 PROJECT SCHEDULE:

A. The Baseline Schedule must show the sequence in which the Contractor proposes to perform the Work, and account for all major and intermediate Milestone Activities, phasing, restrictions of access, availability of work areas and the availability and use of labor, materials, and equipment.

B. After the Baseline Schedule is approved, the Project Schedule must be the Contractor's working schedule and must be used to plan, organize, execute, and track the Project. The Project Schedule is the primary vehicle used to report actual performance, progress, and convey the Contractor's execution plan to complete the Work.

C. The Project Schedule must show the sequence in which the Contractor proposes to perform the Work, and account for all major and intermediate Milestone Activities, phasing, restrictions of access, availability of work areas and the availability and use of labor, materials, and equipment.

D. The Project Schedule must be the Contractor's working schedule used to plan, organize, execute, and track the Project. The Project Schedule is the primary vehicle used to report actual performance, progress, and convey the Contractor's execution plan to complete all remaining Work.

E. All delay claims must be based on the current approved updates of the Project Schedule.

F. The Contractor must confirm in writing that all Subcontractors performing any portion of the Work are in agreement with the accepted Baseline Schedule and the monthly updates.

G. The amount of detail represented in the Baseline and Project Schedule and supporting documents submitted must, at a minimum, include the following items:

1. Contract Milestones must be identified and included in the Baseline and Project Schedule.
2. All submittal, owner review & approval, purchase, manufacture, and delivery Activities for all major materials and equipment.
3. Deliveries of owner-furnished equipment and/or materials.
4. Preparation, submittal, and approval of drawings, material samples, and safety plans.
5. Preparation, submittal, review, and approval of permits required by all regulatory agencies and other third parties.
6. Performance of tests, submission of test reports, and approval of test results.
7. Commissioning Activities for all commissioned systems and equipment is to be clearly delineated and scheduled such that they will be completed prior to Substantial Completion. Such Activities must include, at a minimum, Pre-Functional testing and check sheets; Testing, Adjusting, and Balancing (TAB) verification; Functional Testing, including testing of all controls; and Owner's demonstration and orientation.
8. Completion dates of all items required for phased completion (if applicable).
9. Completion dates of all items required for Substantial Completion.
10. Completion dates of all items required to obtain a Temporary Certificate of Occupancy (TCO) and Certificate of Occupancy (CO).
11. Completion dates for close-out of regulatory and punch list items prior to Final Acceptance and transfer of the Project.
12. Any additional detail requested by the Commissioner.

H. Activities identified in the Baseline and Project Schedule must have the Duration in units of whole Work Days. Construction Activity Durations must not exceed twenty (20) Work Days unless specifically approved by the City. This is to ensure that Activities are not generalized and that each Activity and sub-Activity are defined as narrowly as reasonable to facilitate schedule tracking. Durations for non-construction Activities such as procurement of materials, delivery of equipment, concrete curing, etc., may exceed twenty (20) Work Days without prior approval; however, these are still subject to review by the City. Durations must be based on the available resources required for performing each Activity and must be the result of definitive labor hours using established production rates, and with consideration of on-site working conditions. If requested by the City, the Contractor must justify the reasonableness of a planned Duration.

I. Activity descriptions must use plain language that clearly and uniquely defines each Activity. Each description must include a verb or work function (e.g. submit, form, pour, etc.), an object (e.g. slab, foundation, etc.) and, for any construction Activities, a specific location. The Work related to each Activity must be limited to one responsibility and one trade.

J. Activity relationships must be assigned to clearly establish predecessor and successor relationships to each Activity. Open-ended Activities are not permitted with the exception of the first and last Activity in the network, the first Activity being NTP and the last being Final Acceptance. The use of relationship lag times is discouraged and only permitted with prior approval by the City. The use of negative lag is never permitted.

K. Activity constraint dates are only to be used to reflect contractual constraints unless specifically authorized by the City.

L. Float or slack, in any schedule, must not be for the exclusive use or benefit of either the City or the Contractor, but must be available for use by both the City and the Contractor.

M. Each resubmittal after the Project Schedule is delivered for acceptance must comply with all requirements of this section. Review and response by the City will be given within fourteen (14) Days after resubmission. The Contractor's receipt of the comments within the time specified must not, in any way, affect the Contractor's responsibility to complete the Project within the time fixed in Schedule A.

N. Failure by the City to return comments or indicate acceptance status will in no way relieve the Contractor's obligation to submit monthly schedule updates.

O. At the request of the City, the Contractor must be required to make a presentation to explain or clarify the intended logical sequence of construction Activities depicted in the detailed Project Schedule. The Contractor and designated scheduler must discuss anticipated challenges and outline construction methodology and flow of work to show how and when major Milestones will be achieved. In addition, the Contractor may, at no cost to the City, be required to participate in additional Project meetings necessary to obtain acceptance of the above-noted submittals.

1.8 ACTIVITY AND CALENDAR CODING STRUCTURE:

A. The Baseline and Project Schedules must contain a sufficient number of Activities to represent adequate planning and execution of the Work so that it shows an accurate flow of work and demonstrates an understanding of the Project by the Contractor.

B. Activity ID and Calendar Coding

1. The Contractor's proposed Activity and calendar coding and must be submitted with the preliminary Project Schedule. A meeting may be requested by the City to discuss the scheme and other schedule information prior to the submittal of the Project Schedule. The accepted coding scheme and WBS Structure must be incorporated into the Project Schedule.

C. Activity ID Coding

1. All Activities/ Resources/ Calendars (Baseline and Project Schedules) must be coded inside the P6 Project Environment / Project Level (NOT the Global Environment/ Enterprise Level) to facilitate selection, sorting and preparation of reports.

2. Activity coding must consist of the Project ID followed by a dash, followed by Activity coding (PROJECT ID-ACTIVITY CODE). Activity codes must be created at the Project level and must utilize the coding scheme outlined in the table below:

Activity Code	Meaning
RESP	Responsibility: Identify the party (e.g. Contractor, Subcontractor, City, etc.) responsible for the Activity.
PHAS	Phase: Breakdown of Activities in Milestones, pre-construction, procurement, construction and close-out Activities.
LOCN	Location: Breakdown by floor or elevation.
AREA	Area: Breakdown by room, area, block or wing. May be used as a subdivision of PHAS to include Milestones, permits, Subcontractor approvals, submittals, fabrication and delivery, and subdivision of the Site and buildings into Logical modules, such as by blocks, wings, etc.
TRAD	Trade: Breakdown by CSI Code or section number in the Specifications.

a. Description of schedule Activities must include terminology that represents the scope of work associated with that particular Activity. Terminology used to describe similar actions must be consistent across all segments of work.

b. Naming convention for schedule Activities must be descriptive and indicate the associated work covered by the Activity. Activities must use a verb, noun, and location of the work in the Activity name.

3. Project Calendar Coding

   a. All calendars created and assigned to Activities must be Project-level calendars. The Calendar Name must consist of the Project ID number followed by a dash, followed by a descriptive Calendar Name (PROJECT ID-CALENDAR NAME).

1.9 WORK BREAKDOWN STRUCTURE:

A. Structure must be submitted with the preliminary Project Schedule. The levels (nodes) must include, but not be limited to:

1. LEVEL 01 – The Project Level.
2. LEVEL 02 – Contains a minimum of four (4) nodes: Pre-Construction, Procurement, Construction or Phase of Construction, and Closeout.
3. LEVEL 03 – Decomposition of each of the four (4) nodes in Level 02 into its constituent parts. This level must target specific, tangible, deliverable scopes of Project Work.

B. The Contractor's proposed WBS must be submitted with the preliminary Project Schedule. The accepted WBS Structure must be incorporated into the Baseline and Project Schedule.

1.10 MAJOR MILESTONES:

A. The schedule must include both contractual and non-contractual Milestones that are provided by the City. These Milestones must be properly associated with the related Work and maintained to represent the progress of the Project.

1.11 SHORT (THREE-WEEK) INTERVAL / TWO-WEEK LOOK-AHEAD:

A. On a bi-weekly basis, the Contractor must provide a three (3) week short interval schedule in a format satisfactory to the City. The purpose of this schedule is to report the actual progress of the past week against the previous short interval look-ahead Activities and add any additional Activities planned for the next two (2) weeks. Electronic files and hard copies must be provided to the City on the first day of each work week with the prior week's actual progress included.

B. Each task listed on the short interval schedule must be representative of the most current Project Schedule Update and include a reference to an Activity shown on the current update.

C. The short interval schedule must list all required DDC coordinated activities, including special inspections.

1.12 SUBMITTALS:

A. General

1. Development of the Baseline Schedule and updating of the Project Schedule must follow the DCMA and AACE International guidelines.
2. Each electronic submission of the Project Schedule must be assigned a unique file name consisting of the Project ID (as noted on the NTP followed by a dash followed by a unique file name clearly marked (i.e. ProjID- B000 = B/L rev0, ProjID-B001 = B/L rev01 etc.) to indicate the specific submission. Similarly, update submittals must be named ProjID-Uxxx where xxx is a sequential number, starting with 001, indicating the revision or issue number.

3. The Contractor must provide all submittals in electronic format and two hard copies.

B. Preliminary Project Schedule

1. For acceptance of the preliminary Project Schedule, the Contractor must submit the following:

a. Two (2) 11” x 17” hard copies of the proposed preliminary Project Schedule, as well as the native electronic schedule data file, in .XER file format, per the direction of the City.

b. A Schedule Narrative Report detailing the Contractor’s initial plan for executing the Contract work within the allotted Contract Duration, and include the following explanation of their provided preliminary schedule:

i. The proposed WBS;
ii. All proposed Project Calendars;
iii. All proposed Activity Codes, clearly defined;
iv. The proposed Activity ID format; and
v. Schedule basis narrative, which must memorialize assumptions made in the development of the schedule.

C. Baseline Schedule

1. The City will normally return comments within ten (10) Work Days after receipt of the initial Project Schedule Submission. If any of the required submissions are returned to the Contractor for corrections or revisions, they must be resubmitted within five (5) Work Days from receipt of comments. Each resubmittal must comply with the requirements enumerated above. Review and response by the City will be given within ten (10) Work Days after resubmission.

2. At the request of the City, the Contractor will be required to participate in Project meetings necessary to obtain an acceptance of the above noted submittals.

3. Baseline Schedule submittal must contain a Narrative Report. It must include the following, or as directed by the City:

a. A description of the Project scope and how the Work is represented in the schedule Activities;

b. A description of the overall sequence of major components of Work;

c. Planned work week for each definable feature of work;

d. Description of the Critical Path and near Critical Paths;

e. How weather will be accommodated in the schedule, including a description of the weather calendar and the Activities it is applied to, and the NOAA Inclement Weather data that defined the number of non-work days;

f. How regulatory, operational or third-party constraints are accommodated in the schedule;

g. Description of key Project coordination points or events;

h. Discussion of long lead items and basis of time frames for submittals; and

i. Potential opportunities and risks, including quantification of the schedule reduction or expansion.

D. Project Schedule Updates

1. Every schedule submittal must be provided with a corresponding narrative. These schedule submittals and narratives are to be submitted in hard copy, as well as in the native electronic

format, as attachments to emails or other media accepted by the City. When opened, the electronic format must provide flawless restoration of the native files (P6 (.XER) for Primavera and MS Word and/or Adobe Acrobat for Narrative and supporting document submittals).

2. For each submittal of the updated Project Schedule, the following layouts, reports, and graphics are required in the specified formats, unless otherwise directed by the City:

   a. The Contractor must furnish two (2) 11” x 17” color hard copies of the complete progress schedule with each initial schedule update and final update incorporating comments furnished by the City. Additionally, the Contractor must provide the native electronic schedule data file, in .XER file format with the initial and final schedule update submission.

   b. An Activity bar chart Layout grouped by Activity Code and then sorted by Start Date, Finish Date, and then Total Float.

   c. Each Activity line must display the Activity ID (Act ID), Description (Name), Original Duration (OD), Remaining Duration (RD), Start Date (ES), Finish Date (EF), and Total Float (TF), Baseline Original Duration (BL OD) Baseline Start (BL Start), Baseline Finish (BL Fin), Baseline Total Float (BL TF).

   d. An Activities progress bar must show both current progress update ES and EF, and baseline ES and EF. The top line of the bar chart area must contain the updated ES and EF; the second line below must depict the accepted baseline ES and EF dates.

3. The City may request additional standard P6 reports from time to time at no additional cost.

4. The Monthly Update submittal must contain a Narrative Report. It must include the following, or as directed by the City:

   a. Any changes to the schedule basis narrative;

   b. Overall health of the Project;

   c. Actual Activity Start Dates;

   d. Actual Activity Finish Dates;

   e. The physical conditions that were used to update Activities percent complete;

   f. Percent of Work reported in place;

   g. A description of the overall sequence of major components of Work;

   h. Description of the Critical Path and near Critical Paths;

   i. Description of key Project coordination points or events;

   j. Discussion of long lead items and basis of time frames for submittals;

   k. Potential opportunities and risks, including quantification of the schedule reduction or expansion;

   l. Assumptions/exclusions made in the schedule;

   m. Contract and Milestone completion date status:

      i. Number of Days ahead or behind schedule and; and

      ii. Days lost/gained compared with the previous update.

   n. Lookahead report listing each Activity in the CPM schedule that is scheduled to be performed during the next reporting period;

o. Changes in Activity description, Logic, or Duration must be submitted as a separate Proposed Schedule and approved by the City prior to being submitted as an official update. Once allowed, said changes must be grouped and organized in the report in a manner that communicates in detail the rationale associated with each change and the impact upon construction sequence, relationships and the Critical Path. A standard Digger Report is not sufficient to meet this requirement;

p. Added/deleted Activities and the rationale associated with each action;

q. Pending issues and status of other items;

r. Permits, in a tabular format, showing the status and change in status of all permits;

s. Contract modifications; and

t. Extra Work, including change orders.

1.13 PROJECT SCHEDULE UPDATING:

A. The initial updating must take place immediately after the City accepts the Contractor's Baseline Schedule. The Data Date for the first update must not exceed seven (7) Days from the date of receipt of the accepted Baseline Schedule, or as directed by the City.

B. Subsequent updates of the Project Schedule must be submitted monthly until Substantial Completion. The schedule Data Date must be the last Work Day of the period unless otherwise directed by the City. Updates must be provided to the City no later than seven (7) Days after the 'schedule Data Date'.

C. Updates must reflect actual or reasonably anticipated progress as of the last Work Day of the period.

D. The City may request meetings with the Contractor to review the Project Schedule and narrative and jointly verify Project health and information.

E. In addition, the City may request meetings with the Contractor's scheduling representative to:

1. Resolve out-of-sequence Logic.

2. Should out-of-sequence progress occur where Activities have reported progress without predecessor Activities being completed, the Contractor must obtain the City's approval in a Proposed Schedule before revising the Logic ties to reflect the way the Work is actually being performed. Use of progress override by default mechanisms that may be included in CPM scheduling software systems will not be allowed except on a case-by-case basis with the approval of the City. A written explanation for each instance must be included in the monthly submittal narrative.

3. Assess the impact, if any, of any pending change orders.

4. Incorporate accepted time extensions.

5. Review revised Logic (as-built and projected) and changes in Activity Duration, cost, and labor hours assigned.

F. Contractor's failure to provide required scheduling information within the required timeframe or to adhere to the currently accepted schedule may result in rejection of all or a portion of the progress payment until such time as the required schedule information is submitted and accepted by the City.

G. Delays to the Critical Path – Whenever it becomes apparent from the monthly CPM schedule update that delays to the Critical Path have occurred due to action or inaction of the Contractor, and as a result the date for Substantial Completion will not be met, the Contractor must promptly take some or all of the following actions at no additional cost to the City, unless otherwise directed by the City:

1. Increase construction manpower in such quantities and crafts as will substantially eliminate the backlog of Work.
2. Increase the number of working hours per shift, shifts per day, or Work Days per week; the amount of construction equipment; the forms for concrete work; etc., or any combination of the foregoing to substantially eliminate the backlog of Work.
3. Reschedule Activities to achieve maximum practical concurrence of accomplishment of Activities and comply with the revised schedule.
4. Submit to the City for review a written statement of the steps the Contractor intends to take to remove or arrest the delay to the schedule.
5. Add to its equipment and materials or construction forces, as well as increase the working hours, if operations for critical, less critical or non-critical Activities fall behind the Contractor's Baseline Schedule at any time during the construction period.

H. The City may, at any time during the Project and at no additional cost to the City, require the Contractor to develop a more detailed schedule/ Fragnet than depicted in the Baseline Schedule to provide a clearer understanding of the effort needed to complete an Activity or group of Activities.

I. If the City determines that either the Critical Path is in the negative by four (4) weeks, or that the Project's date for completion may be affected, the Contractor may be required, at no additional cost to the City, to prepare a Recovery Schedule. Such Recovery Schedule is subject to review and acceptance by the City. The Recovery Schedule must propose alternative methods, overtime, and other means available to the Contractor to recover the delays incurred to date.

J. The Contractor must submit an "As-Built Schedule", as the last schedule update showing all Activities, with the exception of punch list and closeout tasks, at Substantial Completion. This schedule must reflect the exact manner in which the Project was actually constructed.

1.14 TIME IMPACT ANALYSIS:

A. In addition to the requirements of the Standard Construction Contract Article 11, the Contractor must submit a Time Impact Analysis to the Commissioner with all requests for time extension.

B. The Time Impact Analysis must include a written narrative and supporting impact schedule Fragnet detailing the Project delays resulting from the alleged delay. The impact schedule Fragnet, separate and distinct from the Progress Schedule update, must demonstrate that the changes or anticipated delays affect Activities of the current accepted Progress Schedule. The impact schedule will be incorporated into the Progress Schedule only after it is accepted by the Commissioner <u>and</u> a time extension is approved. The Fragnet submitted as part of the Time Impact Analysis must illustrate the impact of these changes or delays on the date for Substantial Completion.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 32 16.10

SECTION 01 32 16.20
PROJECT SCHEDULES (METHOD B)

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 32 16.20

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes the following:
1. Methods
2. Definitions
3. Preliminary, Baseline, and Project Schedule Preparation Timeline
4. Preliminary Project Schedule Development
5. Project Schedule
6. Activity and Calendar Coding Structure
7. Work Breakdown Structure (WBS)
8. Major Milestones
9. Short (Three-Week) Interval/Two-Week Look-Ahead
10. Submittals
11. Project Schedule Updating
12. Time Impact Analysis

1.3 METHODS:

A. The Contractor must comply with Project schedule development and updating requirements as specified herein.

1. The Contractor must employ or retain the services of a Construction Scheduler with verifiable construction scheduling experience, subject to review and acceptance by the City. Upon request, the Contractor must provide the City with qualifications and experience of the proposed scheduling staff member(s).

2. The Contractor must prepare, update, and maintain a detailed Project Schedule using a version of scheduling software that is compatible with the City's Oracle Primavera P6 Enterprise Project Portfolio Management (EPPM). All schedule submittals must be developed using Oracle's Primavera P6 EPPM software. Schedules must be developed using accepted CPM techniques using the Precedence Diagramming Method (PDM). The Project Schedule must be developed following Defense Contract Management Agency (DCMA) and American Association of Cost Engineering International (AACE International) guidance. The Contractor will be required to use

the Contractor's own P6 license (whether single-user or Enterprise license), unless otherwise directed by the Commissioner. If directed by the Commissioner prior to the Notice to Proceed (NTP), the Contractor must use the Department's P6 Enterprise license and develop the Progress Schedule within the Department's Enterprise environment.

3. Once the Baseline Schedule is accepted by the City, progress updates to the Project Schedule must be submitted monthly, unless otherwise directed by the City, until Substantial Completion. The Data Date for the schedule updates must use the last Friday of the month, or as directed by the City.

4. The Contractor will be responsible for providing the monthly schedule updates once the Baseline Schedule is approved. Each monthly schedule update must be accompanied with a schedule narrative that explains the following:

   a) The progress of work during that particular period of performance;
   b) Any changes in schedule Logic;
   c) The physical conditions that were used to update every Activities Percent Complete;
   d) Any change in actual Start and Finish Dates;
   e) Any Duration changes;
   f) Any added and deleted Activities; and,
   g) Any added Extra Work (e.g., change orders).

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Term	**Definition**
Activity	A representation of a discrete portion of the overall scope of Work or an event through Duration and description in a CPM schedule.
Baseline Schedule	The planned and detailed CPM schedule of Activities, including all Logic, Durations, Resource and Cost Loading, and showing the entire scope of Work. The Baseline Schedule must be accepted by the City.
Critical Path	The longest sequence of Activities in a network which establishes the minimum length of time for accomplishment of the end event of the Project.
Critical Path Method (CPM)	A management technique used to plan and control a Project which combines all relevant information into a single plan defining the sequence and Duration of operations and depicting the interrelationship of the Work elements required to complete the Project.
Current Schedule	The most recently updated schedule that captures progress to date and forecasts the dates for each Activity.
Data Date	The date used as a starting point for scheduling calculations. The Data Date is changed to the current end of period date when a schedule is updated for progress.
Duration	The amount of time, in workdays, an Activity will take to perform.

Term	Definition
Finish Date	The earliest estimated date an Activity is calculated to be complete, based on the estimated performance of all prior Activities to which the Activity is logically connected in a progressive relationship.
Free Float	The calculated amount of time that the estimated start or finish of an Activity can be delayed without impacting the start or finish of other downstream Activities logically connected in a progressive relationship. (See Finish Date and Late Finish).
Fragnet	Fragmentary network: a portion of a schedule detailing impacts of an event on specific Activities in the broader schedule.
Inclement Weather	Any weather condition, the duration of which varies in excess of the 3-year average published by the National Oceanic and Atmospheric Administration (NOAA) information for the local area.
Integrated Project Schedule	The Commissioner's overall schedule covering design, procurement, and construction. The Commissioner will use the Contractor's Project Schedule to update the Integrated Project Schedule.
Late Finish	An estimate of the latest plausible date an Activity's completion can be postponed without rendering as unachievable the required completion of any downstream Milestones to which the Activity is Logically connected to in a progressive relationship.
Late Start	An estimate of the latest plausible date an Activity's start can be postponed without rendering as unachievable the required completion of any downstream Milestones to which the Activity is Logically connected to in a progressive relationship.
Logic	A direct progressive relationship between Activities where one Activity's performance restricts the performance of another Activity.
Milestone	A key or critical point in time for reference or measurement.
Network Diagram	A graphic diagram of a network schedule, showing Activities and Activity relationships.
Original Duration	The estimated amount of time, in Work Days, an Activity is expected to take to complete at the beginning of a Project as anticipated by the Contractor based on its planned means and methods at time of bid and documented in the Baseline Schedule.
Percent Complete	The percentage of the scope of Work represented by an Activity completed as of the Data Date calculated as physical percent complete for payment purposes.
Project Schedule	The Contractor's schedule used to manage the orderly and expeditious completion of the Work. The Project Schedule is initially the accepted Baseline Schedule, and is updated throughout the Project.

Term	Definition
Remaining Duration	The amount of time, in Work Days, the remaining scope of Work represented by an Activity is expected to take to complete, measured from the current Data Date.
Resource and Cost Loading	Values assigned for estimated dollars, manpower, equipment and/or materials necessary to complete the scope of Work represented by a specific Activity.
Recovery Schedule	A Recovery Schedule outlining and incorporating extraordinary efforts required to recover lost time with the aim of achieving completion of the Project within the stipulated contract Duration, plus authorized time extensions. In such case, special attention must be given to minimize delays as much as possible and must establish the nature of efforts; for instance, resources and equipment required, extended hours of work, weekend work, accelerated fabrication, required action(s) or effort(s) by the Contractor, its subcontractors, consultants, clients, end users and/or other concerned parties to recover the schedule.
Revised and/or Updated Schedule	A Baseline Schedule, Project Schedule, or Recovery Schedule for the Project that shows the actual Duration of all the completed Activities, including Duration of and the reasons for delays, if any have occurred, AND revisions to all remaining Activities of the Contractor and its subcontractors, including changes, if any, to logical ties, interrelations and the sequence of each of the outlined Activities. Any such revisions should be shown on the row just below the approved schedule of the respective Activity so that revisions can be compared. The Revised and/or updated Schedule must be reviewed and approved by the City.
Start Date	The earliest estimated date an Activity is calculated to begin, based on the estimated performance of all prior Activities to which the Activity is logically connected in a progressive relationship.
Time Impact Analysis	A forward looking (prospective) schedule analysis used to forecast the impact to the Critical Path and to Milestone Finish Dates caused by a single event or series of events. Time Impact Analysis is not a retrospective (forensic) schedule analysis or a what-if schedule analysis of a potential event.
Total Float	The amount of time the start or finish of an Activity can be delayed without affecting the Project completion date.
Work Breakdown Structure (WBS)	WBS is a deliverable-oriented decomposition of a Project into smaller components. A WBS provides the necessary framework for detailed cost estimating and control along with providing guidance for schedule development and control.
Work Days (WD)	Work Days are every consecutive day on the calendar, excluding weekends (Saturday and Sunday) and holidays.

1.5 PRELIMINARY, BASELINE, AND PROJECT SCHEDULE PREPARATION TIMELINE:

A. Upon receipt of the NTP, the Contractor must promptly prepare a preliminary Project Schedule and subsequently a Baseline Schedule and must submit for the City's acceptance as follows:

1. Submit the Contractor's CPM Scheduler's qualifications to the City for approval within seven (7) Days after NTP. The City will respond to the submittal within seven (7) Days of the submittal receipt.
2. The preliminary Project Schedule must be submitted no later than twenty-one (21) Days after NTP.
3. The initial submittal of the Baseline Schedule must be provided to the City for review no later than forty-five (45) Days after NTP.
4. The Contractor must incorporate all corrections and revisions required by the City and provide an updated version of the Baseline Schedule for review and acceptance no later than seventy-five (75) Days after NTP to ensure that the Baseline Schedule is accepted no later than ninety (90) Days after the NTP. The ninety (90) Days must include fourteen (14) Days review time by the City for each submittal of the Baseline Schedule.
5. Once accepted, the Baseline Schedule will be the basis of Project Schedule updates.

B. Remedies

1. Preliminary Project Schedule: The City will take a credit of three thousand dollars ($3,000) if the preliminary Project Schedule is not submitted within twenty-one (21) Days of the NTP.
2. Acceptable Baseline Schedule: The City will take a credit of five thousand dollars ($5,000) if an acceptable Baseline Schedule is not submitted within ninety (90) Days of the NTP.
3. Monthly Progress Schedule updates: The City will take a credit of two thousand dollars ($2,000) for each schedule update not submitted within the period it was due.
4. Scheduling Firm Services: If an acceptable Baseline Schedule is not provided by the Contractor within ninety (90) Days of the NTP or three (3) updates are not provided by the Contractor during the period they are due, the City may engage the services of a scheduling firm to develop a Project schedule or update an existing schedule. The total cost of such services will be deducted from the monies due to the Contractor.
   a. Any schedules and updates developed by such scheduling firm are for the City's sole use and do not, in any way, represent an acceptance of responsibility by the City to schedule the Work or relieve the Contractor of the obligation to complete the Work within the Durations specified by the Contract.
5. The City will only accept the submitted information after all corrections have been made and all issues have been resolved. The City may find the Contractor in default if items required by this Section are incomplete.

1.6 PRELIMINARY PROJECT SCHEDULE DEVELOPMENT:

A. The preliminary Project Schedule must be a detailed plan (division level per Construction Specifications Institute (CSI) MasterFormat) of all operations, including submittals, permitting, testing, and construction Activities, for either the first ninety (90) Days after NTP or to the point where the Contractor plans to mobilize on site (whichever is greater). This submittal will also depict a summary level (section level per CSI MasterFormat) schedule of the major Activities for the remainder of the Work.

B. The preliminary Project Schedule will be reviewed by the City and returned with comments, as necessary, within fourteen (14) Days of submittal receipt. Information from the preliminary Project Schedule will be the general foundation for development of the Baseline Schedule.

1.7 PROJECT SCHEDULE:

A. The Baseline Schedule must show the sequence in which the Contractor proposes to perform the Work, and account for all major and intermediate Milestone Activities, phasing, restrictions of access, availability of work areas and the availability and use of labor, materials, and equipment.

B. After the Baseline Schedule is approved, the Project Schedule must be the Contractor's working schedule and must be used to plan, organize, execute, and track the Project. The Project Schedule is the primary vehicle used to report actual performance, progress, and convey the Contractor's execution plan to complete all of the Work.

C. The Project Schedule must show the sequence in which the Contractor proposes to perform the Work, and account for all major and intermediate Milestone Activities, phasing, restrictions of access, availability of work areas and the availability and use of labor, materials, and equipment.

D. The Project Schedule must be the Contractor's working schedule used to plan, organize, execute, and track the Project. The Project Schedule is the primary vehicle used to report actual performance, progress, and convey the Contractor's execution plan to complete all remaining Work.

E. All delay claims must be based on the current approved updates of the Project Schedule.

F. The Contractor must confirm in writing that all subcontractors performing any portion of the Work are in agreement with the accepted Baseline Schedule and the monthly updates.

G. The amount of detail represented in the Baseline and Project Schedule and supporting documents submitted must, at a minimum, include the following items :

1. Contract Milestones must be identified and included in the Baseline and Project Schedule.
2. All submittal, owner review & approval, purchase, manufacture, and delivery Activities for all major materials and equipment.
3. Deliveries of owner-furnished equipment and/or materials.
4. Preparation, submittal, and approval of drawings, material samples, and safety plans.
5. Preparation, submittal, review, and approval of permits required by all regulatory agencies and other third parties.
6. Performance of tests, submission of test reports, and approval of test results.
7. Commissioning Activities for all commissioned systems and equipment is to be clearly delineated and scheduled such that they will be completed prior to Substantial Completion. Such Activities must include, at a minimum, Pre-Functional testing and check sheets; Testing, Adjusting, and Balancing (TAB) verification; Functional Testing, including testing of all controls; and Owner's demonstration and orientation.
8. Completion dates of all items required for phased completion (if applicable).
9. Completion dates of all items required for Substantial Completion.
10. Completion dates of all items required to obtain a Temporary Certificate of Occupancy (TCO) and Certificate of Occupancy (CO).
11. Completion dates for close-out of regulatory and punch list items prior to Final Acceptance and transfer of the Project.
12. Any additional detail requested by the Commissioner.

H. Activities identified in the Baseline and Project Schedule must have the Duration in units of whole Work Days. Construction Activity Durations must not exceed twenty (20) work days unless specifically approved by the City. This is to ensure that Activities are not generalized and that each Activity and sub-Activity are defined as narrowly as reasonable to facilitate schedule tracking. Durations for non-construction Activities such as procurement of materials, delivery of equipment, concrete curing, etc., may exceed twenty (20) work days without prior approval; however, these are still subject to review by the City. Durations must be based on the available resources required for performing each Activity and must be the result of definitive labor hours using established production rates, and with consideration of on-site working conditions. If requested by the City, the Contractor must justify the reasonableness of a planned Duration.

I. Activity descriptions must use plain language that clearly and uniquely define each Activity. Each description must include a verb or work function (e.g. submit, form, pour etc.) an object (e.g. slab, foundation, etc.) and, for any construction Activities, a specific location. The Work related to each Activity must be limited to one responsibility and one trade.

J. Activity relationships must be assigned to clearly establish predecessor and successor relationships to each Activity. Open-ended Activities are not permitted with the exception of the first and last Activities in the network, the first Activity being NTP and the last being Final Acceptance. The use of relationship lag times is discouraged and only permitted with prior approval by the City. The use of negative lag is never permitted.

K. Activity constraint dates are only to be used to reflect contractual constraints unless specifically authorized by the City.

L. Float or slack in any schedule must not be for the exclusive use or benefit of either the City or the Contractor, but must be available for use by both the City and the Contractor.

M. Each resubmittal after the Project Schedule is delivered for acceptance must comply with all requirements of this section. Review and response by the City will be given within fourteen (14) Days after resubmission. The Contractor's receipt of the comments within the time specified must not in any way affect the Contractor's responsibility to complete the Project within the time fixed in Schedule A.

N. Failure by the City to return comments or indicate acceptance status will in no way relieve the Contractor's obligation to submit monthly schedule updates.

O. At the request of the City, the Contractor must be required to make a presentation to explain or clarify the intended logical sequence of construction Activities depicted in the detailed Project Schedule. The Contractor and designated scheduler must discuss anticipated challenges and outline construction methodology and flow of work to show how and when major Milestones will be achieved. In addition, the Contractor may, at no cost to the City, be required to participate in additional Project meetings necessary to obtain acceptance of the above noted submittals.

1.8 ACTIVITY AND CALENDAR CODING STRUCTURE:

A. The Baseline and Project Schedules must contain a sufficient number of Activities to represent adequate planning and execution of the Work so that it shows an accurate flow of work and demonstrates an understanding of the Project by the Contractor.

B. Activity ID and Calendar Coding

1. The Contractor's proposed Activity and calendar coding and must be submitted with the preliminary Project Schedule. A meeting may be requested by the City to discuss the scheme and other schedule information prior to the submittal of the Project Schedule. The accepted coding scheme and WBS Structure must be incorporated into the Project Schedule.

C. Activity ID Coding

1. All Activities/Resources/Calendars (Baseline and Project Schedules) must be coded inside the P6 Project Environment / Project Level (NOT the Global Environment/Enterprise Level) to facilitate selection, sorting and preparation of reports.

2. Activity coding must consist of the Project ID followed by a dash, followed by Activity coding (PROJECT ID-ACTIVITY CODE). Activity codes must be created at the Project level and must utilize the coding scheme outlined in the table below:

Activity Code	Meaning
RESP	Responsibility: Identify the party (e.g. Contractor, subcontractor, City, etc.) responsible for the Activity.
PHAS	Phase: Breakdown of Activities in Milestones, pre-construction, procurement, construction and close-out Activities.
LOCN	Location: Breakdown by floor or elevation.
AREA	Area: Breakdown by room, area, block or wing. May be used as a subdivision of PHAS to include Milestones, permits, subcontractor approvals, submittals, fabrication and delivery, and subdivision of the Site and buildings into Logical modules, such as by blocks, wings, etc.
TRAD	Trade: Breakdown by CSI Code or section number in the Specifications.

a. Description of schedule Activities must include terminology that represents the scope of work associated with that particular Activity. Terminology used to describe similar actions must be consistent across all segments of work.

b. Naming convention for schedule Activities must be descriptive and indicate the associated work covered by the Activity. Activities must use a verb, noun, and location of the work in the Activity name.

3. Project Calendar Coding

a. All calendars created and assigned to Activities must be Project-level calendars. The Calendar Name must consist of the Project ID number followed by a dash, followed by a descriptive Calendar Name (PROJECT ID-CALENDAR NAME).

1.9 WORK BREAKDOWN STRUCTURE:

A. A multi-level hierarchal WBS must be incorporated in all P6 schedules. An initial, proposed WBS must be submitted with the preliminary Project Schedule. The levels (nodes) must include, but not be limited to:

1. LEVEL 01 – The Project Level.
2. LEVEL 02 – Contains a minimum of four (4) nodes; Pre-Construction, Procurement, Construction or Phase of Construction, and Closeout.
3. LEVEL 03 – Decomposition of each of the four (4) nodes in Level 02 into its constituent parts. This level must target specific, tangible, deliverable scopes of the Project Work.

B. The Contractor's proposed WBS must be submitted with the preliminary Project Schedule. The accepted WBS must be incorporated into the Baseline and Project Schedule.

1.10 MAJOR MILESTONES:

A. The schedule must include both contractual and non-contractual Milestones that are provided by the City. These Milestones must be properly associated with the related Work packages and maintained to represent the progress of the Project.

1.11 SHORT (THREE-WEEK) INTERVAL / TWO-WEEK LOOK-AHEAD:

A. On a bi-weekly basis, the Contractor must provide a three (3) week short interval schedule in a format satisfactory to the City. The purpose of this schedule is to report the actual progress of the past week against the previous short interval look-ahead Activities and add any additional Activities planned for the next two (2) weeks. Electronic files and hard copies must be provided to the City on the first day of each work week with the prior week's actual progress included.

B. Each Task listed on the short interval schedule must be representative of the most current Project Schedule Update and include a reference to an Activity shown on the current update.

C. The short interval schedule must list all required DDC coordinated activities, including special inspections.

1.12 SUBMITTALS:

A. General

1. Development of the Baseline Schedule and updating of the Project Schedule must follow the DCMA and AACE International guidelines.

2. Each electronic submission of the Project Schedule must be assigned a unique file name consisting of the Project ID (as noted on the NTP followed by a dash followed by a unique file name clearly marked (i.e. ProjID- B000 = B/L rev0, ProjID-B001 = B/L rev01 etc.) to indicate the specific submission. Similarly, update submittals must be named ProjID-Uxxx where xxx is a sequential number, starting with 001, indicating the revision or issue number.

3. The Contractor must provide all submittals in electronic format and two hard copies.

B. Preliminary Project Schedule

1. For acceptance of the preliminary Project Schedule the Contractor must submit the following:

a. Two (2) 11" x 17" hard copies of the proposed preliminary Project schedule, as well as the native electronic schedule data file, in .XER file format, per the direction of the City.

b. A Schedule Narrative Report detailing the Contractor's initial plan for executing the Contract work within the allotted Contract Duration, and include the following explanation of their provided preliminary schedule:

i. The proposed WBS;
ii. All proposed Project Calendars;
iii. All proposed Activity Codes, clearly defined;
iv. The proposed Activity ID format; and
v. Schedule basis narrative, which must memorialize assumptions made in the development of the schedule.

C. Baseline Schedule

1. The City will return comments within ten (10) Work Days after receipt of the initial Project Schedule Submission. If any of the required submissions are returned to the Contractor for

corrections or revisions, they must be resubmitted within five (5) Work Days from receipt of comments. Each resubmittal must comply with the requirements enumerated above. Review and response by the City will be given within ten (10) Work Days after resubmission.

2. At the request of the City, the Contractor will be required to participate in Project meetings necessary to obtain an acceptance of the above noted submittals.

3. Baseline Schedule submittal must contain a Narrative Report. It must include the following, or as directed by the City:

   a. A description of the Project scope and how the Work is represented in the schedule Activities;

   b. A description of the overall sequence of major components of Work;

   c. Planned work week for each definable feature of work;

   d. Description of the Critical Path and near Critical Paths;

   e. Basis of Durations, described in terms of quantity and production rate;

   f. How weather will be accommodated in the schedule, including a description of the weather calendar and the Activities it is applied to, and the NOAA Inclement Weather data that defined the number of non-Work Days;

   g. How regulatory, operational or third-party constraints are accommodated in the schedule;

   h. Description of key Project coordination points or events;

   i. Discussion of long lead items and basis of time frames for submittals;

   j. Description of anticipated means and methods for large quantity production Activities; and,

   k. Potential opportunities and risks, including quantification of the schedule reduction or expansion.

D. Project Schedule Updates

1. Every schedule submittal must be provided with a corresponding narrative. These schedule submittals and narratives are to be submitted in hard copy, as well as in the native electronic format, as attachments to emails or other media accepted by the City. When opened, the electronic format must provide flawless restoration of the native files (P6 (.XER) for Primavera schedule files and MS Word and/or Adobe Acrobat for Narrative and supporting document submittals).

2. For each submittal of the updated Project Schedule, the following layouts, reports, and graphics are required in the specified formats, unless otherwise directed by the City:

   a. The Contractor must furnish two (2) 11” x 17” hard copies of the complete progress schedule with each initial schedule update and final update incorporating comments furnished by the City. Additionally, the Contractor must provide the native electronic schedule data file, in .XER file format, with the initial and final schedule update submission.

   b. An Activity bar chart layout grouped by Activity Code and then sorted by Start Date, Finish Date, and then Total Float.

   c. Each Activity line must display the Activity ID (Act ID), Description (Name), Original Duration (OD), Remaining Duration (RD), Start Date (ES), Finish Date (EF), and Total

Float (TF), Baseline Original Duration (BL OD) Baseline Start (BL Start), Baseline Finish (BL Fin), Baseline Total Float (BL TF).

d. An Activities progress bar must show both current progress update ES and EF, and baseline ES and EF. The top line of the bar chart area must contain the updated ES and EF; the second line below must depict the accepted baseline ES and EF dates.

3. The City may request additional standard P6 reports from time to time at no additional cost.

4. The Monthly Update submittal must contain a Narrative Report. It must include the following, or as directed by the City:

a. Any changes to the schedule basis narrative
b. A discussion of progress through the update period and status of the Project with respect to completion of the schedule. The progress reporting must detail work Activities that relate to the Project's Critical Path and if these Activities are progressing as planned.
c. A discussion of changes, delays or other circumstances affecting Progress including identified risks and opportunities and the Contractor's strategy.
d. A listing and brief explanation of modifications to the previously submitted network including Logic changes and Activity additions, deletions or modifications.
e. An update on the status of long lead items and whether the item is on the Critical Path.
f. The Contractor must report on all out of sequence Activities, the cause of this deviation to plan, and the proposed resolution of this issue.
g. The Contractor must include an explanation of assumptions and exclusions made in developing the schedule update and narrative.
h. A table of permits, showing status and any changes in status.

5. The Contractor must provide a copy of the computer file(s) in electronic format or other media accepted by the City. When opened, the electronic format must provide flawless restoration of the native files and an electronic copy of the Narrative Report.

1.13 PROJECT SCHEDULE UPDATING:

A. The initial updating must take place immediately after the City accepts the Contractor's Baseline Schedule. The Data Date for the first update must not exceed seven (7) Days from the date of receipt of the accepted Baseline Schedule, or as directed by the City.

B. Subsequent updates of the Project Schedule must be submitted monthly until Substantial Completion. The schedule data date must be the last Work Day of the period unless otherwise directed by the City. Updates must be provided to the City no later than seven (7) Days after the 'schedule Data Date'.

C. Updates must reflect actual or reasonably anticipated progress as of the last Work Day of the period.

D. The City may request meetings with the Contractor to review the Project Schedule and Narrative and jointly verify Project health and information.

E. In addition, the City may request meetings with the Contractor's scheduling representative to:

1. Resolve out-of-sequence Logic;

2. Should out-of-sequence progress occur where Activities have reported progress without predecessor Activities being completed, the Contractor must obtain the City's approval in a Proposed Schedule before revising the Logic ties to reflect the way the Work is actually being performed. Use of progress override by default mechanisms that may be included in CPM scheduling software systems will not be allowed except on a case-by-case basis with the

approval of the City. A written explanation for each instance must be included in the monthly submittal narrative.

3. Assess the impact, if any, of any pending change orders.

4. Incorporate accepted time extensions.

5. Review revised Logic (as-built and projected) and changes in Activity Duration, cost, and labor hours assigned.

F. Contractor's failure to provide required scheduling information within the required timeframe or to adhere to the currently accepted schedule may result in rejection of all or a portion of the progress payment until such time as the required schedule information is submitted and accepted by the City.

G. Delays to the Critical Path – Whenever it becomes apparent from the monthly CPM schedule update that delays to the Critical Path have occurred due to action or inaction of the Contractor and, as a result, the date for Substantial Completion will not be met, the Contractor must promptly take some or all of the following actions at no additional cost to the City, unless otherwise directed by the City:

1. Increase construction manpower in such quantities and crafts as will substantially eliminate the backlog of Work.

2. Increase the number of working hours per shift, shifts per day, or Work Days per week; the amount of construction equipment; the forms for concrete work; etc., or any combination of the foregoing to substantially eliminate the backlog of Work.

3. Reschedule Activities to achieve maximum practical concurrence of accomplishment of Activities and comply with the revised schedule.

4. Submit to the City for review a written statement of the steps the Contractor intends to take to remove or arrest the delay to the schedule.

5. Add to its equipment and materials or construction forces, as well as increase the working hours, if operations for critical, less critical or non-critical Activities fall behind the Contractor's Baseline Schedule at any time during the construction period.

H. The City may, at any time during the Project and at no additional cost to the City, require the Contractor to develop a more detailed schedule/ Fragnet than depicted in the Baseline Schedule to provide a clearer understanding of the effort needed to complete an Activity or group of Activities.

I. If the City determines that either the Critical Path is in the negative by four (4) weeks, or that the Project's date for completion may be affected, the Contractor may be required, at no additional cost to the City, to prepare a Recovery Schedule. Such Recovery Schedule is subject to review and acceptance by the City.

1. The recovery schedule must propose alternative methods, overtime, and other means available to the Contractor to recover the delays incurred to date.

2. The Recovery Schedule must be resource-loaded with manpower and equipment required to bring the date for Substantial Completion back into compliance.

J. The Contractor must submit an "As-Built Schedule", as the last schedule update showing all Activities, with the exception of punch list and closeout tasks, at Substantial Completion. This schedule must reflect the exact manner in which the Project was actually constructed.

1.14 TIME IMPACT ANALYSIS:

A. In addition to the requirements of the Standard Construction Contract Article 11, the Contractor must submit a Time Impact Analysis to the Engineer with all requests for time extension.

B. The Time Impact Analysis must include a written narrative and supporting impact schedule Fragnet detailing the Project delays resulting from the alleged delay. The impact schedule Fragnet, separate and distinct from the Progress Schedule update, must demonstrate that the changes or anticipated delays affect Activities of the current accepted Progress Schedule. The impact schedule will be incorporated into the Progress Schedule only after it is accepted by the Commissioner and a time extension is approved. The Fragnet submitted as part of the Time Impact Analysis must illustrate the impact of these changes or delays on the date for Substantial Completion.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 32 16.20

SECTION 01 32 16.30
PROJECT SCHEDULES (METHOD C)

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 32 16.30

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes the following:

1. Methods
2. Definitions
3. Preliminary, Baseline, and Project Schedule Preparation Timeline
4. Preliminary Project Schedule Development
5. Project Schedule
6. Activity and Calendar Coding Structure
7. Work Breakdown Structure (WBS)
8. Major Milestones
9. Short (Three-Week) Interval/Two-Week Look-Ahead
10. Submittals
11. Project Schedule Updating
12. Time Impact Analysis

1.3 METHODS:

A. The Contractor must comply with Project schedule development and updating requirements as specified herein.

1. The Contractor must employ or retain the services of a Construction Scheduler with verifiable construction scheduling experience, subject to review and acceptance by the City. Upon request, the Contractor must provide the City with qualifications and experience of the proposed scheduling staff member(s).

2. The Contractor must prepare, update, and maintain a detailed Project Schedule using a version of scheduling software that is compatible with the City's Oracle Primavera P6 Enterprise Project Portfolio Management (EPPM). All schedule submittals must be developed using Oracle's Primavera P6 EPPM software. Schedules must be developed using accepted CPM techniques using the Precedence Diagramming Method (PDM). The Project Schedule must be developed following Defense Contract Management Agency (DCMA), and American Association of Cost Engineering International (AACE International) guidance. The Contractor will be required to use the Contractor's own P6 license (whether single-user or Enterprise

license), unless otherwise directed by the Commissioner. If directed by the Commissioner prior to the Notice to Proceed (NTP), the Contractor must use the Department's P6 Enterprise license and develop the Progress Schedule within the Department's Enterprise environment.

3. Once the Baseline Schedule is accepted by the City, progress updates to the Project Schedule must be submitted monthly, unless otherwise directed by the City, until Substantial Completion. The Data Date for the schedule updates must use the last Friday of the month, or as directed by the City.

4. The Contractor must be responsible for providing the monthly schedule updates once the Baseline Schedule is approved. Each monthly schedule update must be accompanied with a schedule narrative that explains the following:

   a) The progress of work during that particular period of performance;
   b) Any changes in schedule Logic;
   c) The physical conditions that were used to update every Activities Percent Complete;
   d) Any change in actual Start and Finish Dates;
   e) Any Duration changes;
   f) Any added and deleted Activities; and
   g) Any added Extra Work (e.g., change orders).

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Term	**Definition**
Activity	A representation of a discrete portion of the overall scope of Work or an event through Duration and description in a CPM schedule.
Baseline Schedule	The planned and detailed CPM schedule of Activities, including all Logic, Durations, Resource and Cost Loading, and showing the entire scope of Work. The Baseline Schedule must be accepted by the City.
Critical Path	The longest sequence of Activities in a network which establishes the minimum length of time for accomplishment of the end event of the Project.
Critical Path Method (CPM)	A management technique used to plan and control a project which combines all relevant information into a single plan defining the sequence and Duration of operations and depicting the interrelationship of the Work elements required to complete the Project.
Current Schedule	The most recently updated schedule that captures progress to date and forecasts the dates for each Activity.
Data Date	The date used as a starting point for scheduling calculations. The Data Date is changed to the current end of period date when a schedule is updated for progress.

Term	Definition
Duration	The amount of time, in workdays, an Activity will take to perform.
Finish Date	The earliest estimated date an Activity is calculated to be complete, based on the estimated performance of all prior Activities to which the Activity is logically connected in a progressive relationship.
Free Float	The calculated amount of time that the estimated start or finish of an Activity can be delayed without impacting the start or finish of other downstream Activities logically connected in a progressive relationship. (See Finish Date and Late Finish).
Fragnet	Fragmentary network: a portion of a schedule detailing impacts of an event on specific Activities in the broader schedule.
Inclement Weather	Any weather condition, the duration of which varies in excess of the 3-year average published by the National Oceanic and Atmospheric Administration (NOAA) information for the local area.
Integrated Project Schedule	The Commissioner's overall schedule covering design, procurement, and construction. The Commissioner will use the Contractor's Project Schedule to update the Integrated Project Schedule.
Late Finish	An estimate of the latest plausible date an Activity's completion can be postponed without rendering as unachievable the required completion of any downstream Milestones to which the Activity is Logically connected to in a progressive relationship.
Late Start	An estimate of the latest plausible date an Activity's start can be postponed without rendering as unachievable the required completion of any downstream Milestones to which the Activity is Logically connected to in a progressive relationship.
Logic	A direct progressive relationship between Activities where one Activity's performance restricts the performance of another Activity.
Milestone	A key or critical point in time for reference or measurement.
Network Diagram	A graphic diagram of a network schedule, showing Activities and Activity relationships.
Original Duration	The estimated amount of time, in Work Days, an Activity is expected to take to complete at the beginning of a project as anticipated by the Contractor based on its planned means and methods at time of bid and documented in the Baseline Schedule.
Percent Complete	The percentage of the scope of Work represented by an Activity completed as of the Data Date calculated as physical percent complete for payment purposes.

Term	Definition
Project Schedule	The Contractor's schedule used to manage the orderly and expeditious completion of the Work. The Project Schedule is initially the accepted Baseline Schedule, and is updated throughout the Project.
Remaining Duration	The amount of time, in Work Days, the remaining scope of Work represented by an Activity is expected to take to complete, measured from the current Data Date.
Resource and Cost Loading	Values assigned for estimated dollars, manpower, equipment and/or materials necessary to complete the scope of Work represented by a specific Activity.
Recovery Schedule	A Recovery Schedule outlining and incorporating extraordinary efforts required to recover lost time with the aim of achieving completion of the Project within the stipulated contract Duration, plus authorized time extensions. In such case, special attention must be given to minimize delays and must establish the nature of efforts; for instance, resources and equipment required, extended hours of work, weekend work, accelerated fabrication, required action(s) or effort(s) by the Contractor, its Subcontractors, consultants, clients, end users and/or other concerned parties to recover the schedule.
Revised and/or Updated Schedule	A Baseline Schedule, or Progress Project Schedule, or Recovery Schedule for the Project that shows the actual Duration of all the completed Activities, including Duration of and the reasons for delays, if any have occurred, AND revisions to all remaining Activities of the Contractor and its Subcontractors, including changes, if any, to logical ties, interrelations and the sequence of each of the outlined Activities. Any such revisions should be shown on the row just below the approved schedule of the respective Activity so that revisions can be compared. The Revised and/or updated Schedule must be reviewed and approved by the City.
Start Date	The earliest estimated date an Activity is calculated to begin, based on the estimated performance of all prior Activities to which the Activity is logically connected in a progressive relationship.
Time Impact Analysis	A forward looking (prospective) schedule analysis used to forecast the impact to the Critical Path and to Milestone Finish Dates caused by a single event or series of events. Time Impact Analysis is not a retrospective (forensic) schedule analysis or a what-if schedule analysis of a potential event.
Total Float	The amount of time the start or finish of an Activity can be delayed without affecting the Project completion date.

Term	Definition
Work Breakdown Structure (WBS)	WBS is a deliverable-oriented decomposition of a Project into smaller components. A WBS provides the necessary framework for detailed cost estimating and control along with providing guidance for schedule development and control.
Work Days (WD)	Work Days are every consecutive day on the calendar, excluding weekends (Saturday and Sunday) and holidays.

1.5 PRELIMINARY, BASELINE, AND PROJECT SCHEDULE PREPARATION TIMELINE:

A. Upon receipt of the NTP, the Contractor must promptly prepare a preliminary Project Schedule and subsequently a Baseline Schedule and must submit for the City's acceptance as follows:

1. Submit the Contractor's CPM Scheduler's qualifications to the City for approval within seven (7) Days after NTP. The City will respond to the submittal within seven (7) Days of the submittal receipt.
2. The preliminary Project Schedule must be submitted no later than twenty-one (21) Days after NTP.
3. The initial submittal of the Baseline Schedule must be provided to the City for review no later than forty-five (45) Days after NTP.
4. The Contractor must incorporate all corrections and revisions required by the City and provide an updated version of the Baseline Schedule for review and acceptance no later than seventy-five (75) Days after NTP to ensure that the Baseline Schedule is accepted no later than ninety (90) Days after the NTP. The ninety (90) Days must include fourteen (14) Days review time by the City for each submittal of the Baseline Schedule.
5. Once accepted, the Baseline Schedule will be the basis of Project Schedule updates.

B. Remedies

1. Preliminary Project Schedule: The City will take a credit of three thousand dollars ($3,000) if the preliminary Project Schedule is not submitted within twenty-one (21) Days of the NTP.
2. Acceptable Baseline Schedule: The City will take a credit of five thousand dollars ($5,000) if an acceptable Baseline Schedule is not submitted within ninety (90) Days of the NTP.
3. Monthly Progress Schedule updates: The City will take a credit of two thousand dollars ($2,000) for each schedule update not submitted within the period it was due.
4. Scheduling Firm Services: If an acceptable Baseline Schedule is not provided by the Contractor within ninety (90) Days of the NTP or three (3) updates are not provided by the Contractor during the period they are due, the City may engage the services of a scheduling firm to develop a Project schedule or update an existing schedule. The total costs of such services will be deducted from the monies due to the Contractor.
5. Any schedules and updates developed by such scheduling firm are for the City's sole use and do not, in any way, represent an acceptance of responsibility by the City to schedule the Work or relieve the Contractor of the obligation to complete the Work within the Durations specified by the Contract.

6. The City will only accept the submitted information after all corrections have been made and all issues have been resolved. The City may find the Contractor in default if items required by this Section are incomplete.

1.6 PRELIMINARY PROJECT SCHEDULE DEVELOPMENT:

A. The preliminary Project Schedule must be a detailed plan (division level per Construction Specifications Institute (CIS) MasterFormat) of all operations, including submittals, permitting, testing, and construction Activities, for either the first ninety (90) Days after NTP or to the point where the Contractor plans to mobilize on site (whichever is greater). This submittal will also depict a summary level (section level per CSI MasterFormat) schedule of the major Activities for the remainder of the Work.

B. The preliminary Project Schedule will be reviewed by the City and returned with comments, as necessary, within fourteen (14) Days of submittal receipt. Information from the preliminary Project Schedule will be the general foundation for development of the Baseline Schedule.

1.7 PROJECT SCHEDULE:

A. The Baseline Schedule must show the sequence in which the Contractor proposes to perform the Work, and account for all major and intermediate Milestone Activities, phasing, restrictions of access, availability of work areas and the availability and use of labor, materials, and equipment.

B. After the Baseline Schedule is approved, the Project Schedule must be the Contractor's working schedule and must be used to plan, organize, execute and track the Project. The Project Schedule is the primary vehicle used to report actual performance, progress, and convey the Contractor’s execution plan to complete the Work.

C. The Project Schedule must show the sequence in which the Contractor proposes to perform the Work, and account for all major and intermediate Milestone Activities, phasing, restrictions of access, availability of work areas and the availability and use of labor, materials, and equipment.

D. The Project Schedule must be the Contractor's working schedule used to plan, organize, execute, and track the Project. The Project Schedule is the primary vehicle used to report actual performance, progress, and convey the Contractor's execution plan to complete all remaining Work.

E. All delay claims must be based on the current approved updates of the Project Schedule.

F. The Contractor must confirm in writing that all Subcontractors performing any portion of the Work are in agreement with the accepted Baseline Schedule and the monthly updates.

G. The amount of detail represented in the Baseline and Project Schedule and supporting documents submitted must, at a minimum, include the following, items:

1. Contract Milestones must be identified and included in the Baseline and Project Schedule.
2. All submittal, owner review & approval, purchase, manufacture, and delivery Activities for all major materials and equipment.
3. Deliveries of owner-furnished equipment and/or materials.
4. Preparation, submittal, and approval of drawings, material samples, and safety plans.
5. Preparation, submittal, review, and approval of permits required by all regulatory agencies and other third parties.
6. Performance of tests, submission of test reports, and approval of test results.

7. Commissioning Activities for all commissioned systems and equipment is to be clearly delineated and scheduled such that they will be completed prior to Substantial Completion. Such Activities must include, at a minimum, Pre-Functional testing and check sheets; Testing, Adjusting, and Balancing (TAB) verification; Functional Testing, including testing of all controls; and Owner's demonstration and orientation.

8. Completion dates of all items required for phased completion (if applicable).

9. Completion dates of all items required for Substantial Completion.

10. Completion dates of all items required to obtain a Temporary Certificate of Occupancy (TCO) and Certificate of Occupancy (CO).

11. Completion dates for close-out of regulatory and punch list items prior to Final Acceptance and transfer of the Project.

12. Any additional detail requested by the Commissioner.

H. Activities identified in the Baseline and Project Schedule must have the Duration in units of whole Work Days. Construction Activity Durations must not exceed twenty (20) Work Days unless specifically approved by the City. This is to ensure that Activities are not generalized and that each Activity and sub-Activity are defined as narrowly as reasonable to facilitate schedule tracking. Durations for non-construction Activities such as procurement of materials, delivery of equipment, concrete curing, etc. may exceed twenty (20) Work Days without prior approval; however, these are still subject to review by the City. Durations must be based on the available resources required for performing each Activity and must be the result of definitive labor hours using established production rates, and with consideration of on-site working conditions. If requested by the City, the Contractor must justify the reasonableness of a planned Duration.

I. Activity descriptions must use plain language that clearly and uniquely defines each Activity. Each description must include a verb or work function (e.g. submit, form, pour etc.), an object (e.g. slab, foundation, etc.) and, for any construction Activities, a specific location. The Work related to each Activity must be limited to one responsibility and one trade.

J. Activity relationships must be assigned to clearly establish predecessor and successor relationships to each Activity. Open-ended Activities are not permitted with the exception of the first and last Activities in the network, the first Activity being NTP and the last being Final Acceptance. The use of relationship lag times is discouraged and only permitted with prior approval by the City. The use of negative lag is never permitted.

K. Activity constraint dates are only to be used to reflect contractual constraints unless specifically authorized by the City.

L. Float or slack, in any schedule, must not be for the exclusive use or benefit of either the City or the Contractor, but must be available for use by both the City and the Contractor.

M. Each resubmittal after the Project Schedule is delivered for acceptance must comply with all requirements of this section. Review and response by the City will be given within fourteen (14) Days after resubmission. The Contractor's receipt of the comments within the time specified must not, in any way, affect the Contractor's responsibility to complete the Project within the time fixed in Schedule A.

N. Failure by the City to return comments or indicate acceptance status will in no way relieve the Contractor's obligation to submit monthly schedule updates.

O. At the request of the City, the Contractor must be required to make a presentation to explain or clarify the intended logical sequence of construction Activities depicted in the detailed Project Schedule. The Contractor and designated scheduler must discuss anticipated challenges and outline construction methodology and flow of work to show how and when major Milestones will be achieved. In addition,

the Contractor may, at no cost to the City, be required to participate in additional Project meetings necessary to obtain acceptance of the above-noted submittals.

P. The Contractor must provide a Cost Flow Projection (CFP) summary covering from NTP to Final Acceptance. The CFP summary must match the expected billings for each period of performance.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.7.Q

Q. Schedule Cost and Resource Loading

1. At the direction of the City, and at no additional cost to the City, a Project Schedule must be cost loaded within thirty (30) Days after acceptance of the Baseline Schedule.
2. The Contractor must accurately load all Project Activities with direct field labor associated with the craft or trades required to complete that Activity. All labor must be noted in manhours required to complete the tasking. The Contractor must include in all Activities the hours required of for major pieces of equipment.
3. All Resource ID's must have a unique identifier assigned by the Contractor, and approved by the City, so the Project-specific data can be separated from other data in the system.
4. Cost loading must be accomplished by adding a single summary level cost loaded Activity in the Project Schedule. This Activity will allow initial generation and monthly updates of the planned value that is time-phased into monthly periods.
5. The intent of the cost loading is to facilitate cost forecasting, tracking, and reporting of monthly cost projection. Every month, the cost loaded summary Activity must be updated with earned value for prior months and revised monthly forecast for future periods. If there is a significant difference between the actual cumulative monthly invoice and the cumulative planned value from the cost loaded Project Schedule for any reporting month, the Contractor must provide the City with the reason for variance in the schedule narrative.

1.8 ACTIVITY AND CALENDAR CODING STRUCTURE:

A. The Baseline and Project Schedules must contain a sufficient number of Activities to represent adequate planning and execution of the Work so that it shows an accurate flow of work and demonstrates an understanding of the Project by the Contractor.

B. Activity ID and Calendar Coding

1. The Contractor's proposed Activity and calendar coding and must be submitted with the preliminary Project Schedule. A meeting may be requested by the City to discuss the scheme and other schedule information prior to the submittal of the Project Schedule. The accepted coding scheme and WBS Structure must be incorporated into the Project Schedule.

C. Activity ID Coding

1. All Activities/Resources/Calendars (Baseline and Project Schedules) must be coded inside the P6 Project Environment / Project Level (NOT the Global Environment/Enterprise Level) to facilitate selection, sorting and preparation of reports.
2. Activity coding must consist of the Project ID followed by a dash, followed by Activity coding (PROJECT ID-ACTIVITY CODE). Activity codes must be created at the Project level and must utilize the coding scheme outlined in the table below:

Activity Code	Meaning
RESP	Responsibility: Identify the party (e.g. Contractor, Subcontractor, City, etc.) responsible for the Activity.
PHAS	Phase: Breakdown of Activities in Milestones, pre-construction, procurement, construction and close-out Activities.
LOCN	Location: Breakdown by floor or elevation.
AREA	Area: Breakdown by room, area, block or wing. May be used as a subdivision of PHAS to include Milestones, permits, Subcontractor approvals, submittals, fabrication and delivery, and subdivision of the Site and buildings into Logical modules, such as by blocks, wings, etc.
TRAD	Trade: Breakdown by CSI Code or section number in the Specifications.

a. Description of schedule Activities must include terminology that represents the scope of work associated with that particular Activity. Terminology used to describe similar actions must be consistent across all segments of work.

b. Naming convention for schedule Activities must be descriptive and indicate the associated work covered by the Activity. Activities must use a verb, noun, and location of the work in the Activity name.

3. Project Calendar Coding

a. All calendars created and assigned to Activities must be Project-level calendars. The Calendar Name must consist of the Project ID number followed by a dash, followed by a descriptive Calendar Name (PROJECT ID-CALENDAR NAME).

1.9 WORK BREAKDOWN STRUCTURE:

A. A multi-level hierarchal WBS must be incorporated in all P6 schedules. An initial, proposed WBS must be submitted with the preliminary Project Schedule. The levels (nodes) must include, but not be limited to:

1. LEVEL 01 – The Project Level.
2. LEVEL 02 – Contains a minimum of four (4) nodes: Pre-Construction, Procurement, Construction or Phase of Construction, and Closeout.
3. LEVEL 03 – Decomposition of each of the four (4) nodes in Level 02 into its constituent parts. This Level must target specific, tangible, scopes of the Project Work.
4. LEVEL 04 – Decomposition of Level 03 Activities providing work package details that provide an understanding of the process to be used to execute the Project Work.

B. The Contractor's proposed WBS must be submitted with the preliminary Project Schedule. The accepted WBS must be incorporated into the Baseline and Project Schedule.

1.10 MAJOR MILESTONES:

A. The schedule must include both contractual and non-contractual Milestones that are provided by the City. These Milestones must be properly associated with the related Work and maintained to represent the progress of the Project.

1.11 SHORT (THREE-WEEK) INTERVAL / TWO-WEEK LOOK-AHEAD:

A. On a weekly basis, the Contractor must provide a three (3) week short interval schedule in a format satisfactory to the City. The purpose of this schedule is to report the actual progress of the past week against the previous short interval look-ahead Activities and add any additional Activities planned for the next two (2) weeks. Electronic and hard copies must be provided to the City on the first day of each work week with the prior week's actual progress included.

B. Each task listed on the short interval schedule must be representative of the most current Project Schedule Update and include a reference to an Activity shown on the current update.

C. The short interval schedule must list all required DDC coordinated activities, including special inspections.

1.12 SUBMITTALS:

A. General

1. Development of the Baseline Schedule and updating of the Project Schedule must follow the DCMA and AACE International guidelines.

2. Each electronic submission of the Project Schedule must be assigned a unique file name consisting of the Project ID (as noted on the NTP), followed by a dash followed by a unique file name clearly marked (i.e. ProjID- B000 = B/L rev0, ProjID-B001 = B/L rev01 etc.) to indicate the specific submission. Similarly, update submittals must be named ProjID-Uxxx where xxx is a sequential number, starting with 001, indicating the revision or issue number.

3. The Contractor must provide all submittals in electronic format and two hard copies.

B. Preliminary Project Schedule

1. For acceptance of the preliminary Project Schedule, the Contractor must submit the following:

a. Two (2) 11" x 17" hard copies of the proposed preliminary Project Schedule, as well as the native electronic schedule data file, in .XER file format, per the direction of the City.

b. A Schedule Narrative Report detailing the Contractor's initial plan for executing the Contract work within the allotted Contract Duration, and include the following explanation of their provided preliminary schedule:

i. The proposed (WBS);
ii. All proposed Project Calendars;
iii. All proposed Activity Codes, clearly defined;
iv. The proposed Activity ID format; and
v. Schedule basis narrative, which must memorialize the assumptions made in the development of the schedule.

C. Baseline Schedule

1. The City will return comments within ten (10) Work Days after receipt of the initial Project Schedule Submission. If any of the required submissions are returned to the Contractor for corrections or revisions, they must be resubmitted within five (5) Work Days from receipt of comments. Each resubmittal must comply with the requirements enumerated above. Review and response by the City will be given within ten (10) Work Days after resubmission.

2. At the request of the City, the Contractor will be required to participate in Project meetings necessary to obtain an acceptance of the above noted submittals.

3. Baseline Schedule submittal must contain a Narrative Report. It must include the following, or as directed by the City:

   a. A description of the Project scope and how the Work is represented in the schedule Activities;

   b. A description of the overall sequence of major components of Work;

   c. Planned work week for each definable feature of work.

   d. Description of the Critical Path and near Critical Paths;

   e. Basis of Durations, described in terms of quantity and production rate;

   f. How weather will be accommodated in the schedule, including a description of the weather calendar and the Activities it is applied to, and the NOAA Inclement Weather data that defined the number of non-work days;

   g. How regulatory, operational or third-party constraints are accommodated in the schedule;

   h. Description of key Project coordination points or events;

   i. Discussion of long lead items and basis of time frames for submittals;

   j. Description of anticipated means and methods for large quantity production Activities;

   k. Potential opportunities and risks, including quantification of the schedule reduction or expansion; and

   l. Assumptions/exclusions made in the schedule.

D. Project Schedule Updates

1. Every schedule submittal must be provided with a corresponding narrative. These schedule submittals and narratives must be submitted in hard copy and the native electronic format as attachments to emails or other media accepted by the City. When opened, the electronic format must provide flawless restoration of the native files (P6 (.XER) for Primavera schedule files and MS Word and/or Adobe Acrobat for narrative and supporting document submittals).

2. For each submittal of the updated Project Schedule, the following layouts, reports, and graphics are required in the specified formats, unless otherwise directed by the City:

   a. The Contractor must furnish two (2) 11” x 17” hard copies of the complete progress schedule with each initial schedule update and final update incorporating comments furnished by the City. Additionally, the Contractor must provide the native electronic schedule data file, in .XER file format with the initial and final schedule update submission.

   b. An Activity bar chart Layout grouped by Activity Code and then sorted by Start Date, Finish Date, and Total Float.

   c. Each Activity line must display the Activity ID (Act ID), Description (Name), Original Duration (OD), Remaining Duration (RD), Start Date (ES), Finish Date (EF), and Total Float (TF), Baseline Original Duration (BL OD), Baseline Start (BL Start), Baseline Finish (BL Fin), Baseline Total Float (BL TF).

   d. An Activities progress bar must show both current progress update ES and EF, and baseline ES and EF. The top line of the bar chart area must contain the updated ES and EF; the second line below must depict the accepted baseline ES and EF dates.

3. The City may request additional standard P6 reports from time to time at no additional cost.

4. The Monthly Update submittal must contain a Narrative Report. It must include the following, or as directed by the City:

   a. Any changes to the schedule basis narrative;

   b. Overall health of the Project;

   c. Actual Activity Start Dates;

   d. Actual Activity Finish Dates;

   e. The physical conditions that were used to update Activities percent complete

   f. Percent of Work reported in place;

   g. Contract and Milestone completion date status:

      i. Number of Days ahead or behind schedule; and
      ii. Days lost/gained compared with the previous update.

   h. Schedule change report organized by Milestone and area comparing the number of Activities that were planned to start and finish to the number that actually started and finished for the reporting period;

   i. Lookahead report listing each Activity in the CPM schedule that is scheduled to be performed during the next reporting period;

   j. Plans for executing scheduled Activities during the next reporting period;

   k. Analysis, organized by Milestone and area, of the Critical Path and near Critical Path(s) describing:

      i. The nature of the Critical Path/near Critical Path;
      ii. Impact on other Activities, Milestones and Finish dates; and
      iii. Identify, or update, risks and opportunities that may impact the Critical Path/near Critical Paths.

   l. List of current and anticipated delays by Milestone:

      i. Cause of the delay;
      ii. Corrective actions and schedule adjustments to correct the delay;
      iii. Impact of the delay on other Activities, Milestones and completion dates; and
      iv. Weather delays, when applicable. The Contractor must describe how the impacts of weather conditions and constraints were absorbed and accounted for in the schedule.

   m. Changes in Activity description, Logic, or Duration must be submitted as a separate Proposed Schedule and approved by the City prior to being submitted as an official update. Once allowed, said changes must be grouped and organized in the report in a manner that communicates in detail the rationale associated with each change and the impact upon construction sequence, relationships and the Critical Path. A standard Digger Report is not sufficient to meet this requirement;

   n. Added/deleted Activities and the rationale associated with each action;

   o. Pending issues and status of other items;

   p. Permits, in a tabular format, showing the status and change in status of all permits;

   q. Contract modifications;

   r. Current and potential extra Work, including change orders;

s. Status of long lead procurement items and whether the item is on the Critical Path;

t. Status of Project submittals;

u. Out of sequence report describing the necessity of each Activity relationship shown therein, as described within this Section;

v. Illogical progress/restraint reports (if any);

w. Other Project or scheduling concerns;

x. Electronic copy of the latest CPM schedule update file in Primavera (.XER) format; and

y. Primavera scheduling error report.

1.13 PROJECT SCHEDULE UPDATING:

A. The initial updating must take place immediately after the City accepts the Contractor's Baseline Schedule. The Data Date for the first update must not exceed seven (7) Days from the date of receipt of the accepted Baseline Schedule, or as directed by the City.

B. Subsequent updates to the Project Schedule must be submitted monthly until Substantial Completion is achieved. The schedule Data Date must be set to the last Work Day of the period unless otherwise directed by the City. Updates must be provided to the City no later than seven (7) Days after the 'schedule Data Date'.

C. Updates must reflect actual or reasonably anticipated progress as of the last Work Day of the period.

D. The City may request meetings with the Contractor to review the Project Schedule and narrative and jointly verify Project health and information.

E. In addition, the City may request meetings with the Contractor's scheduling representative to:

1. Resolve out-of-sequence Logic.

2. Should out-of-sequence progress occur where Activities have reported progress without predecessor Activities being completed, the Contractor must obtain the City's approval in a Proposed Schedule before revising the Logic ties to reflect the way the Work is actually being performed. Use of progress override by default mechanisms that may be included in CPM scheduling software systems will not be allowed except on a case-by-case basis with the approval of the City. A written explanation for each instance must be included in the monthly submittal narrative.

3. Assess the impact, if any, of any pending change orders.

4. Incorporate accepted time extensions.

5. Review revised Logic (as-built and projected) and changes in Duration, cost, and labor hours assigned.

F. Contractor's failure to provide required scheduling information within the required timeframe or to adhere to the currently accepted schedule may result in rejection of all or a portion of the progress payment until such time as the required schedule information is submitted and accepted by the City.

G. Delays to the Critical Path – Whenever it becomes apparent from the monthly CPM schedule update that delays to the Critical Path have occurred due to action or inaction of the Contractor, and as a result the date for Substantial Completion will not be met, the Contractor must promptly take some or all of the following actions at no additional cost to the City, unless otherwise directed by the City:

1. Increase construction manpower in such quantities and crafts as will substantially eliminate the backlog of Work.

2. Increase the number of working hours per shift, shifts per day, or Work Days per week; the amount of construction equipment; the forms for concrete work; etc., or any combination of the foregoing to substantially eliminate the backlog of Work.

3. Reschedule Activities to achieve maximum resource utilization across the Project and comply with the revised schedule.

4. Submit to the City a written statement of the steps the Contractor intends to take to remove or arrest the delay to the schedule. The Contractor must promptly provide the necessary level of effort to bring the Work back on schedule.

5. Add to its equipment and materials or construction forces, as well as increase the working hours, if operations for critical, less critical, or non-critical Activities fall behind the Contractor's Baseline Schedule at any time during the construction period.

H. The City may, at any time during the Project and at no additional cost to the City, require the Contractor to develop a more detailed schedule/Fragnet than depicted in the Baseline Schedule to provide a clearer understanding of the effort needed to complete an Activity or group of Activities.

I. If the City determines that either the Critical Path is in the negative by four (4) weeks, or that the Project's date for completion may be affected, the Contractor may be required, at no additional cost to the City, to prepare a Recovery Schedule. Such Recovery Schedule is subject to review and acceptance by the City. The Recovery Schedule must propose alternative methods, overtime, and other means available to the Contractor to recover the delays incurred to date.

J. The Contractor must submit an "As-Built Schedule", as the last schedule update showing all Activities, with the exception of punch list and closeout tasks, at Substantial Completion. This schedule must reflect the exact manner in which the Project was actually constructed.

1.14 TIME IMPACT ANALYSIS:

A. In addition to the requirements of the Standard Construction Contract Article 11, the Contractor must submit a Time Impact Analysis to the Engineer with all requests for time extension.

B. The Time Impact Analysis must include a written narrative and supporting impact schedule Fragnet detailing the Project delays resulting from the alleged delay. The impact schedule Fragnet, separate and distinct from the Progress Schedule update, must demonstrate that the changes or anticipated delays affect Activities of the current accepted Progress Schedule. The impact schedule will be incorporated into the Progress Schedule only after it is accepted by the Commissioner and a time extension is approved. The Fragnet submitted as part of the Time Impact Analysis must illustrate the impact of these changes or delays on the date for Substantial Completion.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 32 16.30

SECTION 01 32 33
PHOTOGRAPHIC DOCUMENTATION

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 32 33

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes the following:
1. Photographic Media
2. Construction Photographs
3. Pre-construction Photographs
4. Periodic Construction Progress Photographs
5. Special Photographs
6. DVD Recordings
7. Final Completion Construction Photographs

B. RELATED SECTIONS: include without limitation the following:
1. Section 01 10 00 SUMMARY
2. Section 01 33 00 SUBMITTAL PROCEDURES
3. Section 01 35 91 HISTORIC TREATMENT PROCEDURES
4. Section 01 78 39 CONTRACT RECORD DOCUMENTS
5. Section 01 81 19 INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS

C. PHOTOGRAPHER - The Contractor must employ and pay for the services of a professional photographer who will take photographs showing the progress of the Work.

1.3 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: “Design Consultant” must mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the “Design Consultant” may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.4 SUBMITTALS:

A. Qualification Data: For photographer.

B. Key Plan: With each Progress Photograph Submittal include a key plan of Project site and building with notation of vantage points marked for location and direction of each image. Indicate location, elevation or story of construction. Include same label information as corresponding set of photographs.

C. Construction Progress Photograph Prints: Take Progress Photographs bi-weekly and submit four (4) color prints of each photographic view for each trade to the Commissioner. Such Progress Photographs must be included in each monthly progress report or as otherwise directed by the Commissioner.

D. Digital Files: Submit digital files in the format required.

1.5 QUALITY ASSURANCE:

A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three (3) years.

1.6 COORDINATION:

A. The Contractor and its Subcontractor(s) must cooperate with the photographer and provide auxiliary services requested, including access to Project site and use of temporary facilities, such as temporary lighting required to produce clear and well-lit photographs without obscuring shadows.

1.7 COPYRIGHT:

A. The Contractor must include the provisions of this Subsection 1.7 in the agreement between the Contractor and the Photographer who will provide the construction photographs described in this Section. The Contractor must submit to the Commissioner a copy of its agreement with the Photographer.

B. Any photographs, images and/or other materials produced pursuant to this Agreement, and any and all drafts and/or other preliminary materials in any format related to such items produced pursuant to this Agreement, will, upon their creation, become the exclusive property of the City.

C. Any photographs, images and/or other materials provided pursuant to this Agreement ("Copyrightable Materials") will be considered "work-made-for-hire" within the meaning and purview of Section 101 of the United States Copyright Act, 17 U.S.C. § 101, and the City will be the copyright owner thereof and of all aspects, elements and components thereof in which copyright protection might exist. To the extent that the Copyrightable Materials do not qualify as "work-made-for-hire," the Photographer hereby irrevocably transfers, assigns and conveys exclusive copyright ownership in and to the Copyrightable Materials to the City, free and clear of any liens, claims, or other encumbrances. The Photographer will retain no copyright or intellectual property interest in the Copyrightable Materials. The Copyrightable Materials must be used by the Photographer for no purpose other than in the performance of this Agreement without the prior written permission of the City. The Department may grant the Photographer a license to use the Copyrightable Materials on such terms as determined by the Department and set forth in the license.

D. The Photographer acknowledges that the City may, in its sole discretion, register copyright in the Copyrightable Materials with the United States Copyright Office or any other government agency authorized to grant copyright registrations. The Photographer must fully cooperate in this effort and agrees to provide any and all documentation necessary to accomplish this.

E. The Photographer represents and warrants that the Copyrightable Materials: (i) are wholly original material not published elsewhere (except for material that is in the public domain); (ii) do not violate any copyright Law; (iii) do not constitute defamation or invasion of the right of privacy or publicity; and (iv) are not an infringement, of any kind, of the rights of any third party. To the extent that the Copyrightable Materials incorporate any non-original material, the Photographer has obtained all necessary permissions and clearances, in writing, for the use of such non-original material under this Agreement, copies of which must be provided to the City.

PART II – PRODUCTS

2.1 PHOTOGRAPHIC MEDIA:

A. Digital Images: Digital files must be captured as 7.2 megapixel files or greater, with a minimum pixel array of 2,400 pixels by 3,000 pixels. The camera used to capture the digital files must be a Digital SLR (Single Lens Reflex) camera or approved equal; "point and shoot" cameras or camera phones are not acceptable. Digital cameras must produce images using true optical resolution; "digital zoom" is not acceptable. Images must not be resized or interpolated. The file format for digital files must be Joint Photographic Experts Group format ("JPG"). The digital files must not be modified or processed in any way to alter the JPG file's metadata, including the photograph's original capture date.

B. Digital Files: Digital files must be submitted on Digital Versatile Disk ("DVD") or as specified by the Commissioner. DVDs must be inserted in standard weight Archival Quality clear poly sheet protectors and submitted in a hard cover three (3) ring binder. The information imprinted on each print must be provided on an Excel file included on the DVD. The DVD must be labeled with the Project ID and the Project description. Labeling using adhesive labels is not acceptable.

C. Prints:
   1. Format: 8-by-10-inch (203-by-254-mm) smooth-surface matte color prints on single-weight commercial-grade stock paper, with 1-inch wide margins and punched for standard 3-ring binder.
   2. Identification: On the front of each photograph affix a label in the margin with Project name and date photograph was taken. On the back of each print, provide an applied label or rubber-stamped impression with the following information:
      a. Project Contract I.D. Number.
      b. Project Contract Name.
      c. Name of Contractor. (and Subcontractor Trade Represented)
      d. Subject of Image Taken.
      e. Date and time photograph was taken if not date stamped by camera.
      f. Description of vantage point, indicating location, direction and other pertinent information.
      g. Unique sequential identifier.
      h. Name and address of photographer.

PART III – EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS:

A. General: Take photographs that provide the largest possible depth-of-field while still in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
   1. Maintain key plan with each set of construction photographs that identifies each photographic location and direction of view.

B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
   1. Date and Time: Include date and time in filename for each image.
   2. Field Office Images: Maintain one set of images on USB drive, or other electronic media requested by the Commissioner, in the field office at the Project site so that it is available at all times for reference. Ensure that the images are the same as for those submitted to Commissioner.

3.2 PRE-CONSTRUCTION & PRE-DEMOLITION PHOTOGRAPHS:

A. Before commencement of Contract Work at the Project site, take color photographs of Project site and surrounding properties, including existing structures or items to remain during construction, from different vantage points, as directed by the Commissioner.
   1. Flag applicable excavation areas and construction limits before taking construction photographs.

2. Take photographs of minimum eight (8) views to show existing conditions adjacent to property before starting the Work.
3. Take applicable photographs of minimum eight (8) views of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
4. Take additional photographs as required or directed by the Commissioner to record settlement or cracking of adjacent structures, pavements, and improvements.

B. Demolition Operations: Take photographs as directed by the Commissioner of minimum of eight (8) views each before commencement of demolition operations, at mid-point of operations and at completion of operations.

C. Pre-Demolition Photographs: Take archival quality color photographs, to include all exterior building facades, of all structures at the Project site designated to be fully demolished or removed in compliance with New York City Building Code requirements. Submit four (4) complete sets of pre-demolition photographs, in the format specified herein, to the Commissioner for submission to the New York City Department of Buildings.

3.3 PERIODIC CONSTRUCTION PROGRESS PHOTOGRAPHS:

A. Take photographs of minimum eight (8) views bi-weekly as directed by the Commissioner of construction progress for each contract trade. Select vantage points to show status of construction and progress since last photographs were taken.

3.4 SPECIAL PHOTOGRAPHS:

A. The photographer must take special photographs of subject matter or events as specified in other sections of the Project Specifications from vantage points specified or as otherwise directed by the Commissioner.

B. Historical Elements: As required in Section 01 35 91 HISTORIC TREATMENT PROCEDURES, for Contract Work at designated landmark structures or sites, the photographer, as specified and required by individual sections of the Contract documents or at the direction of the Commissioner, must take images of existing elements scheduled to be removed for replacement, repair or replication in quantities as directed, including post-construction photographs of completed Work as directed by the Commissioner.

1. Take Presentation Quality Photographs of designated landmark structures as directed by the Commissioner for submission to the New York City Landmarks Preservation Commission. Provide a minimum of four (4) color photographic prints of each view as directed.

3.5 VIDEO RECORDING:

A. When Video Recording of Demonstration and Orientation sessions is required, the Contractor must provide the services of a Videographer as indicated in Section 01 79 00 DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION.

3.6 FINAL COMPLETION CONSTRUCTION PHOTOGRAPHS:

A. For submission as Project Record Documents, take color photographs of minimum eight (8) unobstructed views of the completed Project and/or Project site, as directed by the Commissioner and after all scaffolding, hoists, shanties, field offices or other temporary work has been removed and final cleaning has been done after date of Substantial Completion. Submit four (4) sets of each view of Presentation Quality photographic prints, including negatives and/or digital images electronic file.

END OF SECTION 01 32 33

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART I – GENERAL:

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Coordination Drawings, Catalogue Cuts, Material Samples, and other Submittals required by the Contract Documents.

B. Review of Submittals does not relieve the Contractor of responsibility for any Contractor's errors or omissions in such Submittals, nor from responsibility for complying with the requirements of the Contract.

C. Responsibility of the Contractor: The approval of Shop Drawings will be general and will not relieve the Contractor of the following responsibilities:
   1. Accuracy of such Shop Drawings;
   2. Proper fitting and construction of the Work
   3. Furnishing of materials or Work required by the Contract that may not be indicated on the Shop Drawings.

D. Approval of Shop Drawings must not be construed as approving departures from the Contract Drawings, Supplementary Drawings, or Specifications.

E. This Section includes the following:
   1. Definitions
   2. Submission Procedures
   3. Coordination Drawings
   4. LEED Submittals
   5. Ultra Low Sulfur Diesel Fuel Reporting
   6. Construction Photographs and Recordings
   7. As-Built Documents

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION
C. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
D. Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION
E. Section 01 40 00 QUALITY REQUIREMENTS
F. Section 01 77 00 CLOSEOUT PROCEDURES
G. Section 01 78 39 CONTRACT RECORD DOCUMENTS
H. Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS
I. Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS
J. Section 01 81 13.10 ENVIRONMENTALLY PREFERABLE PURCHASING (EPP) COMPLIANCE

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" must mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and Specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

C. Action Submittals: Written and graphic information, or physical samples that require responsive actions and include, without limitation, all Shop Drawings, product data, letters of certification, tests and other information required for quality control and as required by the Contract Documents.

D. Informational Submittals: Written and graphic information that does not require responsive action. Informational Submittals may be rejected for non-compliance with the Contract.

E. Shop Drawings: Drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data, except for coordination drawings, specifically prepared for the Project by the Contractor or any Subcontractor, manufacturer, supplier or distributor, which illustrates how specific portions of the Work must be fabricated and/or installed.

F. Coordination Drawings: As required in Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION.

G. Product Data and Quality Assurance Submittals: Includes manufacturer's standard catalogs, pamphlets, and other printed materials including without limitation the following:

1. Catalogue and Product specifications
2. Installation instructions
3. Color charts
4. Catalog cuts
5. Rough-in diagrams and templates
6. Wiring diagrams
7. Performance curves
8. Operational range diagrams
9. Mill reports
10. Design data and calculations
11. Certification of compliance or conformance
12. Manufacturer's instructions and field reports

1.5 COORDINATION DRAWINGS:

A. Coordination Drawings, General: When coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity, or where limited space availability necessitates coordination, prepare Coordination Drawings according to requirements in individual Sections as a prerequisite to submittal of Shop Drawings.

1. Content: Project-specific information, shown accurately to a scale large enough to indicate and resolve conflicts. Do not base Coordination Drawings on standard printed data. Include the following information, as applicable for the Project:

    a. Use applicable background views as a basis for preparation of coordination layouts. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
    b. Coordinate the addition of trade-specific information by multiple contractors in a sequence that best presents the information and resolution of conflicts between installed components, before submitting for review.
    c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, plumbing, fire protection, and electrical systems.
    d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
    e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
    f. Indicate required installation sequences.
    g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Commissioner indicating proposed resolution of such conflicts.

B. Coordination Drawing Organization: Organize Coordination Drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling raised access floor and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
3. Mechanical Rooms: Provide Coordination Drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:

    a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
    b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
    c. Fire-rated enclosures around ductwork.
    d. HVAC equipment

7. Electrical Work: Show the following:

    a. Runs of vertical and horizontal conduit 1-1/4 inches (32 mm) in diameter and larger.
    b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
    c. Panel board, switch board, switchgear, transformer, busway, generator, and motor-control center locations.
    d. Location of pull boxes and junction boxes, dimensioned from column center lines.

e. Indicate runs and locations of Audio Visual and Information Technology, and security devices.

8. Fire-Protection System: Show the following:

a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.

C. The Contractor must issue the completed Coordination Drawing(s) to the Design Consultant for his/her review. The Design Consultant may call as many meetings as necessary with the Contractor, including attendance by applicable Subcontractors, and may call on the services of the applicable sub consultant(s) where necessary, to resolve any conflicts that become apparent.

D. Upon resolution of any conflicts, the Contractor must provide a final Coordination Drawing(s) which will become the Master Coordination Drawing(s). The Master Coordination Drawing(s) must be signed and dated by the Contractor to indicate acceptance of the arrangement of the Work.

E. A reproducible copy of the Master Coordination Drawing(s) must be provided by the Contractor to each of the appropriate Subcontractor(s), the Resident Engineer and the Design Consultant for information.

F. Shop Drawings must not be submitted prior to acceptance of the final coordinated drawings and must be prepared in accordance with the Master Coordination Drawing(s). No work will be permitted without accepted Shop Drawings. It is therefore essential that this procedure be instituted as quickly as possible.

G. Coordination Drawing Digital Data Files: Prepare coordination digital data files according to the following requirements:

1. File Preparation Format: Same digital data software program, version, and operating system as original Design Drawings.
2. File Submittal Format: Submit or post coordination drawing files using PDF format.
3. BIM File Incorporation: Submit or post coordination drawing files using PDF format, unless otherwise directed by Commissioner.
4. Commissioner will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.

a. Contractor must execute Digital Data File Release and indemnification form provided by Commissioner.
b. Commissioner makes no representations as to the accuracy or completeness of digital data files as they relate to coordination drawings.

1.6 SUBMITTAL PROCEDURES:

A. Refer to Section 01 35 03 GENERAL MECHANICAL REQUIREMENTS and Section 01 35 06 GENERAL ELECTRICAL REQUIREMENTS for additional Submittal requirements involving electrical and mechanical work or equipment of any nature called for in the Project.

B. Coordination: Coordinate preparation and processing of Submittals with performance of construction activities.

1. Coordinate each Submittal with fabrication, purchasing, testing, delivery, other Submittals, and related activities that require sequential activities, with the Submittal Schedule specified in Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION.
2. Coordinate transmittal of different types of Submittals for related parts of the Work so processing will not be delayed because of need to review Submittals concurrently for coordination.
3. The Commissioner reserves the right to withhold action on a Submittal requiring coordination with other Submittals until related Submittals are received.

C. Identification: Place a permanent label or title block on each Submittal for identification.

1. Indicate name of firm or entity that prepared each Submittal on label or title block.

2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Design Consultant.

3. Include the following minimum information on label for processing and recording action taken:
   a. Project name, DDC Project Number, and Contract Number
   b. Date
   c. Name and address of Design Consultant
   d. Name and address of Contractor
   e. Name and address of Subcontractor
   f. Name and address of supplier
   g. Name of manufacturer
   h. Submittal number or other unique identifier, including revision identifier
   i. Number and title of appropriate Specification Section
   j. Drawing number and detail references, as appropriate
   k. Location(s) where product is to be installed, as appropriate
   l. Other necessary identification

D. PDF Submittals:

1. Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number. Bind transmittal form with each submittal file package. Transmittal form must be the first page in the PDF file constituting the submittal.

2. Submittal files received from sources other than the Contractor will be rejected without review. Re-submission of the same drawings or product data must bear the original number of the prior submission and the original titles.

E. Web-Based Project Software Submittals: Prepare submittals as PDF files, or other format indicated by Project software website.

F. Transmittal Form: Provide locations on form for the following information:

1. Project name, DDC Project number and Contract Number
2. Date
3. Destination (To:)
4. Source (From:)
5. Names of Contractor, Subcontractor, manufacturer, and supplier
6. Category and type of Submittal
7. Submittal purpose and description
8. Specification Section number and title
9. Drawing number and detail references, as appropriate
10. Transmittal number, numbered consecutively
11. Submittal and transmittal distribution record
12. Remarks
13. Signature of transmitter

G. Shop Drawings:

1. Procedures for Preparing, Forwarding, Checking, and Returning all Shop Drawings must be, generally, as follows:

   a. The Contractor must make available to its Subcontractors the necessary Contract Documents and must instruct such Subcontractor to determine dimensions and conditions in the field, particularly in reference to coordination between the trade Subcontractors. The Contractor must direct its Subcontractors to prepare Shop Drawings for submission to the Design

Consultant in accordance with the requirements of these General Conditions. The Contractor must also direct its Subcontractors to "Ring Up" corrections made on all re-submissions for approval, so as to be readily seen, and that the appropriate symbol per item 2 below (e.g., "GC") be used to identify the source of the correction or information that has been added.

The Contractor must:

1. Review and be responsible for information shown on its Subcontractor's Shop and Installation Drawings and manufacturers' data, and conformity to Contract Documents.
2. "Ring Up" corrections made on all submissions for approval, so as to be readily seen, and that the symbol "GC", "PL", "HVAC", or "EL" be used to indicate that the correction and/or information added was made by the Contractor and/or its Subcontractor(s).
3. Clearly designate which entity is to perform the Work when the term, "work by others" or other similar phrases are indicated on the Contract Drawings before submission to the Design Consultant.
4. Stamp submissions "Recommended for Acceptance", date and forward to the Design Consultant.

2. The Contractor must promptly prepare and submit project specific layout detail and Shop Drawings of such parts of the Work as are indicated in the Specifications, or as required. These Shop Drawings must be made in accordance with the Contract Drawings, Specifications and Supplementary Drawings, if any. The Shop Drawings must be accurate and distinct and give all the dimensions required for the fabrication, erection, and installation of the Work.

3. Size of Drawings: The Shop Drawings, unless otherwise directed, must be on sheets of the same size as the Contract Drawings, drawn accurately and of sufficient scale to be legible, with a one half (1/2) inch marginal space on each side and a two (2) inch marginal space for binding on the left side.

4. Scope of Drawings: Shop Drawings must be numbered consecutively and must accurately and distinctly represent all aspects of the Work, including without limitation the following:

   a. All working and erection dimensions
   b. Arrangements and sectional views
   c. Necessary details, including performance characteristics and complete information for making necessary connections with other Work
   d. Kinds of materials including thickness and finishes
   e. Identification of products
   f. Fabrication and installation drawings
   g. Roughing-in and setting diagrams
   h. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring
   i. Shop work manufacturing instructions
   j. Templates and patterns
   k. Schedules
   l. Design calculations
   m. Compliance with specified standards
   n. Notation of coordination requirements
   o. Notation of dimensions established by field measurement
   p. Relationship to adjoining construction clearly indicated
   q. Seal and signature of professional engineer if specified
   r. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring
   s. All other information necessary for the Work and/or required by the Commissioner

5. Titles and Reference: Shop Drawings must be dated and contain:
   a. Name of the Project, DDC Project Number, and Contract Number
   b. The descriptive names of equipment or materials covered by the Contract Drawings and the classified item number or numbers.

c. The locations or points and sequence at which materials, or equipment, are to be installed in the Work
d. Cross references to the section number, detail number, and paragraph number of the Contract Specifications
e. Cross references to the sheet number, detail number, etc., of the Contract Drawings

6. Field Measurements: In addition to the above requirements, the Shop Drawings must be signed by the Contractor and, if applicable, the Subcontractor responsible for preparation of the Shop Drawings. Each Shop Drawing must be stamped with the following wording:

   FIELD MEASUREMENTS: The Contractor certifies that it has verified and supplemented the Contract Drawings by taking all required field measurements, which said measurements correctly reflect all field conditions and that this Shop Drawing incorporates said measurements.

7. Contractor's Statement with Submittal: Any Submittal by the Contractor for acceptance, including without limitation, all dimensional drawings of equipment, blueprints, catalogues, models, samples and other data relative to the equipment, the materials, the Work or any part thereof, must be accompanied by a statement that the Submittal has been examined by the Contractor and that everything shown in the Submittal is in accordance with the requirements of the Contract Drawings and Specifications. If there is any discrepancy between what is shown in the Submittal and the requirements of the Contract Drawings and Specifications, the Contractor must, in its statement, list and clearly describe each discrepancy.

8. Acceptance will be given based upon the Contractor's representation that what is shown in the Submittal is in accordance with the requirements of the Contract Drawings and Specifications. If the Contractor's statement indicates any discrepancy between what is shown in the Submittal and the requirements of the Contract Drawings and Specifications, such change is subject to review and prior written acceptance by the Design Consultant. In addition, such change may require a change order in accordance with Article 25 of the Contract. In the event any such change is approved, any additional expense or increased cost in connection with the change is the sole responsibility of the Contractor.

9. Submission of Shop Drawings:

   a. Initial Submission: The Contractor must submit seven (7) copies, or as requested by the Resident Engineer, of each Shop Drawing to the Design Consultant for his/her review and acceptance. If PDF drawings are requested by the Resident Engineer, they must be provided in an original "printed from digital" format, and not scanned. The Design Consultant will transmit Shop Drawings to appropriate sub-consultants for review and acceptance, including Commissioning Authority/Agent as applicable. A satisfactory Shop Drawing will be digitally stamped "No Exceptions Taken", be dated and transmitted by the Design Consultant as follows:

      1) Addressed to the Contractor, with a cc to the following:

         a) Design Consultant's sub consultant(s) as appropriate
         b) DDC

      2) Should the Shop Drawing(s) be "Rejected" or noted "Revise and Resubmit" by the Design Consultant, the Design Consultant will transmit the Shop Drawings to the Contractor with the necessary corrections and changes to be made as indicated thereon.

b. Revisions: The Contractor must make such corrections and changes and again transmit each shop drawing to the Design Consultant. The Contractor must revise and resubmit the Shop Drawing as required by the Design Consultant until the Shop Drawings are stamped “No Exceptions Taken”. However, Shop Drawings which have been stamped "Make Corrections Noted" will be considered an "Acceptable" Shop Drawing and NEED NOT be resubmitted.

c. Commencement of Work: No Work or fabrication called for by the Shop Drawings must be done until the acceptance of the said drawings by the Design Consultant is given. In addition to the foregoing Shop Drawing transmissions, a copy of any Shop Drawing prepared by any of the Contractor’s Subcontractors which Shop Drawing indicated Work related to, adjacent to, impinging upon, or affecting Work to be done by other Subcontractors must be transmitted to the Subcontractors so affected. [These accepted Shop Drawings must be distributed to the affected Subcontractors when required with a copy of the transmittal to the Resident Engineer.]

d. Variations: If the Shop Drawings show variations from the Contract requirements because of standard shop practice or other reasons, the Contractor must make specific mention of such variations in its letter of Submittal. Acceptance of the Shop Drawings must constitute acceptance of the subject matter thereof only and not of any structural apparatus shown or indicated.

H. Product Data:

1. General: Except as otherwise prescribed herein, the submission, review, and acceptance of Product Data and Catalogue cuts must conform to the procedures specified in subsection 1.6 E, Shop Drawings.

2. If information must be specially prepared for the Submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.

3. Mark each copy of the Submittal to show which products and options are applicable.

4. Include the following information, as applicable:

a. Manufacturer's written recommendations.
b. Manufacturer's product specifications.
c. Manufacturer's installation instructions.
d. Standard color charts.
e. Manufacturer's catalog cuts.
f. Wiring diagrams showing factory-installed wiring.
g. Printed performance curves.
h. Operational range diagrams.
i. Mill reports.
j. Standard product operation and maintenance manuals.
k. Compliance with specified referenced standards.
l. Testing by recognized testing agency.
m. Application of testing agency labels and seals.
n. Notation of coordination requirements.

5. Submit Product Data before or concurrent with Samples.

6. Submission of Product Data:

a. Initial Submission: The Contractor must submit seven (7) sets of Product Data to the Design Consultant for his/her review and acceptance. The Design Consultant will transmit Product Data to appropriate sub-consultants for review and acceptance, including Commissioning Authority/Agent as applicable. A satisfactory catalogue cut will be digitally stamped "No Exception Taken", be dated and transmitted as follows:

1) Addressed to the Contractor, with a cc to the following:

   a) Design Consultant's sub consultant(s) as appropriate
   b) DDC

2) Should the Product Data be “Rejected” or noted “Revise and Resubmit” by the Design Consultant, the Design Consultant will return one (1) set of such Product Data to the Contractor with the necessary corrections and changes to be made indicated and one (1) set to DDC.

7. Revisions: The Contractor must make such corrections and changes and again submit seven (7) copies of each Product Data for the review of the Design Consultant. The Contractor must revise and resubmit the Product Data as required by the Design Consultant until the submission is stamped “No Exceptions Taken” by the Design Consultant. However, Product Data which has been stamped "Make Corrections Noted" must be considered an "Accepted" Product Data and NEED NOT be resubmitted.

I. Samples of Materials:

1. For samples of materials involving electrical Work of any nature, refer to Section 01 35 06 GENERAL ELECTRICAL REQUIREMENTS.

2. Samples must be in triplicate or as directed by the Resident Engineer, and of sufficient size to show the quality, type, range of color, finish and texture of the material.

3. Each of the samples must be labeled as follows:

   a. Name of the Project, DDC Project Number and Contract Number
   b. Name and quality of the material
   c. Date
   d. Name of Contractor, subcontractor, manufacturer and supplier
   e. Related Specification or Contract Drawing reference to the samples submitted

4. A letter of transmittal, in triplicate, from the Contractor requesting acceptance must accompany all such samples.

5. Transportation charges to the Design Consultant’s office must be prepaid on all samples forwarded.

6. Samples for testing purposes must be as required in the Specifications.

7. Samples on Display: When samples are specified to be equal to approved product, they must be carefully examined by the Contractor and by those whom the Contractor expects to employ for the furnishing of such materials.

8. Timely Submissions Log/Schedule: Samples must be submitted in accordance with approved Shop Drawing log so as to permit proper consideration without delaying any operation under the Project. Materials should not be ordered until acceptance is received, in writing, from the Design Consultant. All materials must be furnished equal in every respect to the accepted samples.

9. The acceptance of any samples will be given as promptly as possible, and will be only for the characteristic color, texture, strength, or other feature of the material named in such acceptance, and no other. When this acceptance is issued by the Design Consultant, it is done with the distinct understanding that the materials to be furnished will fully and completely comply with the Specifications, the determination of which may be made at some later date by a laboratory test or by other procedure. Use of materials will be permitted only so long as the quality remains equal to the approved samples and complies in every respect with the Specifications, and the colors and textures of the samples on file in the office of the Design Consultant, for the Project.

10. Acceptability of test Data: The Commissioner will be the final judge as to acceptability of laboratory test data and performance in service of materials submitted.

11. Valuable Samples: Valuable samples, such as hardware, plumbing and electrical fixtures, etc., not destroyed by inspection or test, will be returned to the Contractor and may be incorporated into the Work after all questions of acceptability have been settled, providing suitable permanent records are made as to the location of the samples, their properties, etc.

J. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
2. Manufacturer and product name, and model number if applicable.
3. Number and name of room or space.
4. Location within room or space.

K. Supplementary Qualification Data: Prepare written information that demonstrates capabilities and experience of entity. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

L. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.

M. Certificates:

1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.

2. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

4. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

5. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS formats. Include names of firms and personnel certified.

N. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

    a. Name of evaluation organization.
    b. Date of evaluation.
    c. Time period when report is in effect.
    d. Product and manufacturers' names.
    e. Description of product.
    f. Test procedures and results.
    g. Limitations of use.

O. Equivalent Quality: Any material, article and/or equipment which is designated in the Drawings and/or Specifications by a number in the catalogue of any manufacturer or by a manufacturer's grade or trade name is designated for the purpose of describing the material, article and/or equipment and fixing the standard of performance and/or function, as well as the quality and/or finish. Any material, article and/or equipment which is other than what is specified in the Drawings and/or Specifications will only be accepted if the Commissioner makes a written determination that such material, article and/or equipment is equivalent to that which is specified in the Drawings and/or Specifications.

P. The submission of any material, article and/or equipment as the equal of any material, article and/or equipment set forth in the Drawings and/or Specifications as a standard must be accompanied by any and all information essential for determining whether such proposed material, article and/or equipment is equivalent to that which is specified. Such information must include, without limitation, illustrations, drawings, descriptions, catalogues, records of tests, samples, as well as information regarding the finish, durability and satisfactory use of such proposed material, article and/or equipment under similar operating conditions.

Q. Engineering Services Submittals:

1. Performance and Design Criteria: Refer to Section 01 40 00 QUALITY REQUIREMENTS, Article 1.5.

2. Engineering Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file and three paper copies of certificate, signed and sealed by the responsible professional engineer, for each product and system specifically required of the Contractor to be designed or certified by a professional engineer.

    a. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

3. BIM Incorporation: Incorporate engineering services drawing and data files into BIM established for

Project.

a. Prepare engineering services documents in the required formats, including BIM incorporation.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.7

1.7 LEED SUBMITTALS:

A. Comply with Submittal requirements specified in the following sections:

1. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL;
2. Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS, as applicable;
3. Section 01 81 13.13 VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED v3 BUILDINGS;
4. Section 01 81 19 INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS;
5. Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS; and/or,
6. Section 01 91 15 BUILDING ENCLOSURE COMMISSIONING REQUIREMENTS.

B. LEED Building Submittal information must be assembled into one package per each applicable Specification Section, separate from all other non-LEED Submittals. Each Submittal package must have a separate transmittal and identification as described in Subsection 1.5 herein.

C. Number of Copies: Submit four (4) copies of LEED Submittals, in accordance with procedure described in Article 1.5 herein, unless otherwise indicated.

D. Material Safety Data Sheets (MSDSs) for LEED Certification: Submit information necessary to show compliance with LEED certification requirements, which will be the limit of the Design Consultant's review for LEED compliance.

1. Designated LEED Submittals that include non-LEED MSDS data will not be reviewed. The entire Submittal will be returned for re-submission.

E. Product Cut Sheets and/or Shop Drawings for LEED Certification: Provide product cut sheets and/or shop drawings with the Contractor's or sub-contractor's stamp, confirming that the submitted products are the products installed in the Project. For detailed requirements refer to Subsection 1.6 of Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 PROJECTS, or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.

1. Provide the quantity, length, area, volume, weight, and/or cost of each product submitted as required to satisfy LEED documentation requirements. Refer to Subsection 1.6 of Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 PROJECTS.

1.8 ULTRA LOW SULFUR DIESEL FUEL AND BEST AVAILABLE TECHNOLOGY REPORTING:

A. In accordance with Section 01 10 00 SUMMARY, Subsection 1.10 E, the Contractor must submit reports to the Commissioner regarding the use of Ultra Low Sulfur Diesel Fuel and Best Available Technology (BAT) in Non road Vehicles. Submission of such reports must be in accordance with the schedule, format, directions and procedures established by the Commissioner.

1.9 CONSTRUCTION PHOTOGRAPHS AND VIDEO RECORDINGS:

A. Submit construction progress photographs and Video recordings in accordance with requirements of Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION.

1.10 AS-BUILT DOCUMENTS:

A. Submit all as-built documents in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 33 00

SECTION 01 35 03
GENERAL MECHANICAL REQUIREMENTS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 35 03

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. The General Mechanical Requirements contained herein must be followed by the Contractor, as well as its Subcontractor for HVAC work. This Section sets forth the General Requirements applicable to mechanical work for the Project. Such requirements are intended to be read in conjunction with the Specifications and Contract Drawings for the Project. In the event of any conflict between the requirements set forth in this Section and the requirements of the Specifications and/or the Contract Drawings, whichever requirement is the most stringent must take precedence.

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 33 00 SUBMITTAL PROCEDURES
C. Section 01 35 06 GENERAL ELECTRICAL REQUIREMENTS
D. Section 01 42 00 REFERENCES
E. Section 01 77 00 CLOSEOUT PROCEDURES
F. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. CONCEALED PIPING AND DUCTS: piping and ducts hidden from sight in masonry or other construction, in floor fill, trenches, partitions, hung ceilings, furred spaces, pipe shafts and in service tunnels not used for passage. Where piping and ducts run in areas that have hung ceilings, such piping and ducts must be installed in the hung ceilings. For Work on existing piping, any insulation on such existing piping is to be tested for asbestos and abated if found to be positive by a certified asbestos contractor. Such testing and abatement must occur prior to the performance of any Work on these pipes.

1.5 SUBMITTALS:

A. INTENT OF MECHANICAL CONTRACT DRAWINGS – Mechanical Contract Drawings are, in part, diagrammatic and show the general arrangement of the equipment, ducts, and piping included in the Contract and the approximate size and location of the equipment.

B. The Contractor must follow these Contract Drawings in laying out the Work and verify the spaces in which it will be installed. The Contractor must submit, as directed, Mechanical Shop Drawings, roughing drawings,

manufacturer's Shop Drawings, field drawings, cuts, bulletins, etc., of all materials, equipment and methods of installation shown or specified in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

1. Submit sheet metal shop standards. Submit manufacturer's product data including gauges, materials, types of joints, scaling materials and installations for metal ductwork materials and products.
2. Submit scaled layout drawing (3/8"=1') of metal ductwork and fittings including, but not limited to, duct sizes, locations, elevations, slopes of horizontal runs, wall and floor penetrations and connections. Show modifications of indicated requirements made to conform to local shop practice and how those modifications ensure that free area, materials and rigidity are not reduced. Layouts should include all the room plans, mechanical equipment rooms and penthouses. Method of attachment of duct hangers to building construction all with the support details. Coordinate Shop Drawings with related trades prior to submission.
3. Indicate duct fittings, particulars such as gauges, sizes, welds and configuration prior to start of work for low-pressure systems.
4. Submit maintenance data and parts lists for metal ductwork materials and products. Include this data, product data and shop drawings in maintenance manual.

1.6 ACCESS:

A. All Work must be installed by the Contractor to readily provide access for inspection, operation, maintenance and repair. Minor deviations from the arrangement indicated on the Contract Drawings may be made to accomplish this, but they must not be made without prior written approval by the Commissioner.

1.7 CHANGES IN PIPING, DUCTS, AND EQUIPMENT:

A. Wherever field conditions are such that for proper execution of the Work, reasonable changes in location of piping, ducts, and equipment are necessary and required, the Contractor must make such changes as directed and approved, without extra cost to the City.

1.8 CLEANING OF PIPING, DUCTS, AND EQUIPMENT:

A. Piping, ducts, and equipment must be thoroughly cleaned by the Contractor of all dirt, cuttings, and other foreign substances. Should any pipe, duct, or other part of the several systems be obstructed by any foreign matter, the Contractor will be required to pay for disconnecting, cleaning, and reconnecting wherever necessary for the purpose of locating and removing obstructions. The Contractor must pay for repairs to other work damaged in the course of removing obstructions. For work on existing piping, ducts, and equipment, the Contractor must pay special attention during this task so as not to disturb the insulation on such piping, ducts, or equipment.

1.9 STANDARDIZATION OF SIMILAR EQUIPMENT:

A. Unless otherwise particularly specified, all equipment of the same kind, type, or classification, used for identical purposes, must be the product of one (1) manufacturer.

1.10 SUPPORTING STRUCTURES DESIGNED BY THE CONTRACTOR:

A. Unless otherwise specified, supporting structures for equipment to be furnished by the Contractor must be designed by a Professional Engineer licensed in the State of New York retained by the Contractor. Supporting structures must be built by the Contractor of sufficient strength to safely withstand all stresses to which they

may be subjected, within permissible deflections, and must meet the following standards:

1. Structural Steel - ASTM Standard Specifications, AISC and New York City Construction Codes.
2. Concrete for supports for equipment must conform to the Specifications for concrete herein, but in no case must be less than the requirements of the New York City Construction Codes for average concrete.
3. Steel reinforcement for concrete must be of intermediate grade and must meet the requirements of the Standard Specifications for Billet Steel-Concrete Reinforcement Bars, ASTM.
4. Drawings and calculations must be submitted for review and acceptance in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

1.11 ELIMINATION OF NOISE:

A. All systems and/or equipment provided under the Contract must operate without objectionable noise or vibration.

B. Should operation of any one or more of the several systems produce noise or vibration which is, in the opinion of the Commissioner, objectionable, the Contractor must, at its own expense, make changes in piping, equipment, etc., and do all work necessary to eliminate objectionable noise or vibration.

C. Should noise or vibration that is found objectionable by the Commissioner be transmitted by any pipe or portions of the structure from systems and/or equipment installed under the Contract, the Contractor must, at its own expense, install such insulators and make such changes in or additions to the installations as may be necessary to prevent transmission of this noise or vibration.

1.12 PRELIMINARY FIELD TEST:

A. As soon as conditions permit, the Contractor must furnish all necessary labor and materials for, and must make preliminary field tests of the equipment to ascertain compliance with the requirements of the Contract. If the preliminary field tests disclose equipment that does not comply with the Contract, the Contractor must, prior to the acceptance test, make all changes, adjustments, and replacements as required.

1.13 INSTRUCTIONS ON OPERATION:

A. At the time the equipment is placed in permanent operation by the City, the Contractor must make all adjustments and tests required by the Commissioner to prove that such equipment is in proper and satisfactory operating condition. The Contractor must instruct the City's operating personnel on the proper maintenance and operation of the equipment for the period of time called for in the Specifications.

1.14 CERTIFICATES:

A. On completion of the Work, the Contractor must obtain certificates of inspection, approval, and acceptance, and be in compliance with all laws from all agencies and/or entities having jurisdiction over the Work and must deliver these certificates to the Commissioner in accordance with Section 01 77 00 CLOSEOUT PROCEDURES. The Work will not be deemed substantially complete until the certificates have been delivered.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 35 03

SECTION 01 35 06
GENERAL ELECTRICAL REQUIREMENTS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section sets forth the General Requirements applicable to electrical work for the Project. Such requirements are intended to be read in conjunction with the Specifications and Contract Drawings for the Project. In the event of any conflict between the requirements set forth in this Section and the requirements of the Project Specifications and/or the Contract Drawings, whichever requirement is the most stringent, as determined by the Commissioner, must take precedence.

B. This Section includes the following:

1. Related Sections
2. Definitions
3. Procedure for Electrical Approval
4. Submittals
5. Electrical Installation Procedures
6. Electrical Conduit System Including Boxes (Pull, Junction and Outlet)
7. Electrical Wiring Devices
8. Electrical Conductors and Terminations
9. Circuit Protective Devices
10. Distribution Centers
11. Motors
12. Motor Control Equipment

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 33 00 SUBMITTAL PROCEDURES
C. Section 01 35 03 GENERAL MECHANICAL REQUIREMENTS
D. Section 01 42 00 REFERENCES
E. Section 01 77 00 CLOSEOUT PROCEDURES
F. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. WIRING: contains wire and raceway (rigid steel, heavy wall conduit unless specifically indicated otherwise).

B. POWER WIRING: wiring from a panel board or other specified source to a starter (if required), then to a disconnect (if required), then to the final point of usage such as a motor, unit, or device.

C. CONTROL and/or INTERLOCK WIRING: wiring that signals the device to operate or shut down in response to a signal from a remote control device such as a temperature, smoke, pressure, float, etc. device (starters and disconnect switches are not included in this definition) regardless of the voltage required for the controlling device.

D. RIGID STEEL CONDUIT: rigid steel heavy wall conduit that is hot-dip galvanized inside and outside. The conduit must meet the requirements of the latest edition, as amended, of the "Standard for Rigid Steel Conduit" of the Underwriters' Laboratories, Inc. Unless otherwise specified in the Specifications or indicated on the Contract Drawings, rigid steel conduit must be used for all exposed work, all underground conduits in contact with earth, and fire alarms systems, as required by the New York City Construction Codes.

E. ELECTRICAL METALLIC TUBING (EMT): industry standard thin wall conduit of galvanized steel. All elbows, bends, couplings and similar fittings which are installed as a part of the conduit system must be compatible for use with electric metallic tubing. Couplings and terminating fittings must be of the pressure type as approved by the Commissioner. Set screw fittings will not be acceptable. EMT must meet the requirements of the latest edition, as amended, of the "Standard for Electrical Metallic Tubing" of the Underwriters Laboratories Inc. <u>EMT may only be used where specifically indicated. In no case will EMT be permitted in spaces other than hung ceilings and dry wall partitions.</u>

F. FLEXIBLE METALLIC CONDUIT (FMC): a conduit made through the coiling of a self-interlocking ribbed strip of aluminum or steel, forming a hollow tube through which wires can be pulled. For final connections to motors and motorized equipment, not more than a 4' - 0" length of flexible conduit may be used. For watertight installations, this conduit must be of a watertight type, attached with watertight glands or fittings for final connections from outlet box to recessed lighting fixtures and in locations only where specifically permitted by the Specifications or Contract Drawings.

1.5 PROCEDURE FOR ELECTRICAL APPROVAL:

This Section sets forth General Electrical information, as well as required approvals for all electrical work required for the Project, including ancillary electrical work which may be included in the work of other trade Subcontractors.

A. ELECTRIC SERVICE: The electric service supply is subject to commercial and operating variation of the utility company. Proper provision must be made to have all apparatus operate normally under these conditions.

B. ACCEPTANCE: Acceptance and approval of the Work will be contingent upon the inspection and test of the installation by the City regulatory agency.

C. TESTS: The Contractor must notify the Commissioner when the Contractor has completed the work and is ready to have it inspected and tested. Upon completion of the Work, tests must be made as required by the Commissioner of all electrical materials, electrical and associated mechanical equipment, and of appliances installed hereunder. The Contractor must furnish all labor and material for such tests. Should the tests show that any of the material, appliances or workmanship is not first class or not in compliance with the Contract, on written notice the Contractor must remove and promptly replace the materials to be in conformity with the Contract.

D. CERTIFICATE OF THE BUREAU OF ELECTRICAL CONTROL, OF THE DEPARTMENT OF BUILDINGS (B.E.C.): Prior to requesting a substantial completion inspection, the Contractor must file a Certificate of Inspection issued by B.E.C. On completion of the Work, the Contractor must obtain certificates of inspection, approval, acceptance and compliance from all agencies and/or entities having jurisdiction over the work and must deliver these certificates to the Commissioner in accordance with Section 01 77 00 CLOSEOUT PROCEDURES.

E. RESPONSIBILITY FOR CARE AND PROTECTION OF EQUIPMENT:

1. The Contractor furnishing any equipment must be responsible for the equipment until it has been inspected, tested and accepted, in accordance with the requirements of the Contract.

2. After delivery, before and after installation, the Contractor must protect all equipment against theft, injury or damage from all causes. The Contractor must carefully store all equipment received for work which is not immediately installed. If any equipment has been subject to possible injury by water, it must be thoroughly dried out and put through a special dielectric test as directed by the Commissioner, at the expense of the Contractor or replaced by the Contractor without additional cost to the city.

F. UNIFORMITY OF EQUIPMENT: Any two (2) or more pieces of equipment, apparatus or materials of the same kind, type, or classification, which are intended to be used for identical types of service, must be made by the same manufacturer.

1.6 SUBMITTALS:

A. CONTRACTOR'S ELECTRICAL DRAWINGS AND SAMPLES FOR APPROVAL:

1. The Contractor must submit to the Commissioner for approval, in accordance with Section 01 33 00 SUBMITTAL PROCEDURES, complete dimensional drawings of all equipment, wiring diagrams, motor test data, details of control, installation layouts showing all details and locations and including all schedules, and descriptions and supplementary data to comprise complete working drawings and instructions for the performance of the Work. A description of the operation of the equipment and controls must be included. A letter, in triplicate, must accompany each submittal.

2. The Contractor must submit in accordance with Section 01 33 00 SUBMITTAL PROCEDURES, duplicate samples of such materials and appliances as may be requested by the Commissioner for approval. These samples must be properly tagged for identification and submitted for examination and test. After the samples are approved, one (1) sample will be returned to the Contractor and the other sample will be filed in the office of the Commissioner's representative for inspection use. After the Contract is completed, the second set of samples will be returned to the Contractor.

B. TIMELINESS: All material must be submitted in accordance with the Submittal Schedule in sufficient time for the progress of construction. Failure to promptly submit acceptable samples and dimensional drawings of equipment will not be accepted as grounds for an extension of time. The Commissioner may decline to consider submittals unless all related items are submitted at the same time.

C. CONTRACTOR'S STATEMENT WITH SUBMITTALS: Contractor must submit a statement in accordance with Section 01 33 00, SUBMITTAL PROCEDURES.

D. BULLETINS AND INSTRUCTIONS: The Contractor must furnish and deliver to the Commissioner in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS and Section 01 77 00 CLOSEOUT PROCEDURES, after acceptance of the work, four (4) complete sets of instructions, technical bulletins and any other printed matter (diagrams, prints, or drawings) required to provide complete information for the proper operation, maintenance and repair of the equipment and the ordering of spare parts.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 ELECTRICAL INSTALLATION PROCEDURES:

This Sub-Section sets forth the General Installation Procedure that must apply to all electrical work and electrical equipment appearing in the Contract.

(Refer to Sub-Section 1.4 DEFINITIONS for terms used in this section)

A. INTENT OF CONTRACT DOCUMENTS: The Drawings and Specifications are to be interpreted as a means of conveying the scope and intent of the work without giving every minor electrical detail. It is intended, nevertheless, that the Contractor must provide whatever labor and materials are found necessary, within the scope of the Contract, for the successful operation of the installation. Specific details of individual installations are to be finally decided upon when the Contractor submits Working or Shop Drawings for approval to DDC. Whenever there are two (2) or more methods to complete Project work within the Contract scope, the Commissioner reserves the right to choose that method which, in the Commissioner's opinion, will afford the most satisfactory performance, lasting qualities, and access for repairs, even if this selection is the costliest.

B. SCHEMATIC PLANS – APPROXIMATE LOCATIONS: Conduits and wiring are shown on the plans for diagrammatic purposes only. Therefore, conduit layouts may not necessarily give the actual physical route of the conduits. The Contractor who installs a conduit system will also be required, as part of the work, to furnish and install all hangers and pull-boxes, including any special pull-boxes found necessary to overcome interferences, and to facilitate the pulling of electrical cables. Similarly, the locations of equipment, appliances, outlets and other items shown on Contract Drawings are only approximate and are to be definitively established when equipment Shop Drawings are submitted and approved by DDC during construction.

C. SLEEVES: required for conduits passing through walls or floors; must be furnished and set by the Contractor installing the conduits. Sleeves in waterproofed floors must be provided with flashing extending twelve (12) inches in all directions from sleeve and secured to waterproofing. Flashing must be turned down into space between pipe and sleeve and caulked watertight. Flashing must be twenty (20) ounces cold rolled copper. Sleeves must be supplied with welded flanges similar to those supplied by the Subcontractor for Plumbing Work and must extend one (1) inch above finished floor.

D. COORDINATION: The Contractor must keep in close touch with the construction progress and promptly obtain the necessary information for the accurate placement of its work well before Project construction operations obstruct its work. The Contractor is to consult all other Contract Drawings, as well as approved equipment Shop Drawings on file in the Resident Engineer's Field Office. This will aid in avoiding interferences, omissions, and errors in the electrical installation.

E. RESTORATION: If drilling or cutting is done on finished surfaces of equipment or the structure, any marring of the surface must be repaired or replaced by the Contractor. The Contractor must be held responsible for corrective restoration due to its cutting or drilling, and for any damage to the Project or its contents caused by the Contractor or the Contractor's workers. If any piercing of waterproofing occurs because of the installation of the work, the Contractor must restore the waterproofing, at its own expense, to the satisfaction of the Commissioner.

F. ELECTRICAL WORK AT SITE: The Contractor furnishing equipment consisting of a number of related electrical devices or appliances, mounted in a single enclosure, or on a common base, must furnish this unit, ready for connection and operation, complete with internal wiring, connections, terminal boxes with

copper connectors and/or lugs and ample electrical leads. The cost of any wiring, re-wiring, or other work required to be done on this unit in the field, must be borne by the Contractor, without additional cost to the city.

G. COOPERATION AMONG SUBCONTRACTORS: Whenever an electrically operated unit or system involves the combined work of several Subcontractors for its installation and successful operation, the Contractor must require each Subcontractor to exercise the utmost diligence in cooperating with others to produce a complete, harmonious installation.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.2

3.2 ELECTRICAL CONDUIT SYSTEM INCLUDING BOXES (PULL, JUNCTION AND OUTLET):

This Sub-Section sets forth the requirements applying to the installation of electrical conduits, boxes or fittings. Rigid steel conduit must be used throughout, unless otherwise directed by the Commissioner. Where the word 'conduit' is used without a modifier such as, rigid steel, EMT, etc., must be interpreted to mean rigid steel, heavy wall, threaded conduit.

(Refer to Sub-Section 1.4 DEFINITIONS for terms used in this section)

A. INSTALLATIONS AND APPLICATIONS:

1. Unless otherwise specified or indicated on the Contract Drawings, conduit runs must be installed concealed in finished spaces.
2. CONDUIT SIZES: The sizes of conduits must be as indicated on the Contract Drawings. Wherever conduit sizes are not indicated, the conduit must meet the requirements of the New York City Electrical Code to accommodate the conductors to be installed therein.
3. Conduits must be reamed smooth after cutting. No running threads will be permitted. Universal type couplings must be used where required. Conduit joints must be screwed up to butt. Empty conduits after installation must have all open ends temporarily plugged to prevent the entrance of water or other foreign matter.
4. Conduits installed in concrete or masonry must be securely held in place during pouring and construction operations. A group of conduits terminating together must be held in place by a template.
5. UNDERGROUND STEEL CONDUITS: Unless otherwise specified, all underground steel conduits in contact with earth must be encased by the Contractor who installs them, in a covering of not less than two (2) inches of an approved concrete mixture. Concrete mix must be one (1) part cement to four and one-half (4 ½) parts of fine and coarse aggregate.
6. EXCAVATION RESTORATION PERMITS: When installing underground conduits, duct banks or manholes, the Contractor must perform the work of cutting pavement, excavation shoring, keeping trenches or holes pumped dry, backfilling, restoration of surfaces to original condition and removal of excess earth and rubbish from premises. During the work, the Contractor must provide adequate crossovers, protective barriers, lamps, flags, etc., to safeguard traffic and the public. When the work is in a public highway or street, the Contractor must secure and pay for all necessary permits, inspection fees, and the cost of repaving.
7. EXPOSED CONDUIT SUPPORTS: Exposed conduits must be supported by Galvanized hangers with necessary inserts, beam clamps of approved design, or attached to walls or ceilings by expansion bolts. Exposed conduits must be supported or fastened at intervals not more than five (5) feet.

8. Exposed conduits must be installed parallel or at right angles to ceilings, walls and partitions. Where direction changes of exposed conduit cannot be made with neat bends, as may be required around beams or columns, conduit-type fittings must be used.

9. Conduit must be installed with an expansion joint approved by the Commissioner in the following conditions:

   a. Wherever the conduit crosses a building expansion joint, the Contractor will be held responsible for determining where the building expansion joints are located.

   b. Every 200 feet, when in straight runs of 200 feet or longer.

10. Conduits may only enter and leave a floating slab in a vertical direction, and only in an approved manner. Horizontal entries into floating slabs are not permitted.

11. Conduits installed in pipe shafts must be properly supported to carry the total weight of the raceway system complete with cable. In addition, at least one (1) horizontal brace per 10 ft. section must be provided to assure stability of the raceway system.

12. BUSHINGS AND LOCKNUTS: Approved bushings and locknuts must be used wherever conduits enter outlet boxes, switch boxes, pull boxes, panel board cabinets, etc.

13. CONDUIT BENDS: must be made without kinking conduit or appreciably reducing the internal diameter. All bends in conduits of two (2) inch in diameter or larger must be made with a hydraulic or power pipe bender. The radius of the inner edge of any bend must not be less than six (6) times the internal diameter of the conduit where rubber covered conductors are to be installed, and not less than ten (10) times the internal diameter of the conduit where lead covered conductors are to be used. Long gradual sweeps will be required, rather than sharp bends, when changes of direction are necessary.

14. EMPTY CONDUITS

   a. TESTS: All conduits and ducts required to be installed and left empty must be tested for clear bore and correct installation by the Contractor using a ball mandrel and a brush and snake before the installation will be accepted. The ball must be turned to approximately 85% of the internal diameter of the raceway to be tested. Two (2) short wire brushes must be included in the mandrel assembly. Snaking of conduits, ducts, etc., must be performed by the Contractor in the presence of the Resident Engineer. Any conduits or ducts which reject the mandrel must be cleared at once with the Contractor bearing all costs, such as chopping concrete, to replace the defective conduit and restore the surface to its original condition.

   b. TAGS: Numbers or letters must be assigned to the various conduit runs, and as they test clear they must be identified by a fiber tag not less than 1-¼ inch width, attached by means of a nylon cord. All conduit terminations in panel, splice or pull boxes, as well as those out of the floor or ceiling, must be tagged.

   c. TEST RECORDS: As the conduit runs clear, a record must be kept under the heading of "Empty Conduit Tested, Left Clear, Tagged and Capped" showing conduit designation, diameter, location, date tested and by whom. When complete, this record must be signed by the Resident Engineer and submitted in triplicate for approval. This record must be entered on the Contract Record Drawings under Section 01 78 39 CONTRACT RECORD DOCUMENTS.

   d. CAPPING: After test, all empty conduit and duct openings, must be capped or plugged by the Contractor as directed.

   e. DRAG LINES: A drag line must be left in all empty conduit.

B. BOXES:

1. The Contractor must furnish and erect all pull boxes indicated on the plans or where required. Sides, top and bottom of pull boxes must be Galvanized coated and must be built of No. 12 USSG steel reinforced at corners by substantial angle irons and riveted or welded to plates. Bottom or side of pull boxes must be removable and held in place by corrosion resistant machine screws. Pull boxes in damp locations must have threaded hubs and gaskets and be NEMA 4X. All pull boxes must be suspended from ceiling or walls in the most substantial manner.

2. In centering outlets, the Contractor is cautioned to allow for overhead pipes, ducts and other obstructions, and for variations in arrangement and thickness of fireproofing, soundproofing and plastering. Precaution should be exercised regarding the location of window and door trims, paneling, etc. Mistakes resulting from failure to exercise precaution must be corrected by the Contractor at no additional cost to the City. Outlets in hung ceilings must be supported from the black iron or structure.

3. The exact location of all outlets in finished rooms must be as directed by the Commissioner. When the interior finish has been applied, the Contractor must make any necessary adjustment of its work to properly center the outlets. All outlet boxes for local switches near doors must be located at the strike side of doors as finally hung, whether so indicated on the drawings or not.

4. Exposed wall outlet boxes must be securely anchored, erected neatly and tight against the walls.

5. All wall outlets of each type must be set accurately at the same level on each floor, except where otherwise specified or directed by the Commissioner. Where special conditions occur, outlets must be located as directed.

6. MOUNTING HEIGHTS: The following heights are standard heights and are subject to correction due to coordination with Contract Drawings. All such changes must be approved by the Resident Engineer. Heights given are from finished floor to center line of outlet or device on wall or partition, unless otherwise indicated.

a.	General Convenience Outlets (mount vertical)	1'-6"
b.	Clock Outlets	8'-6"or 1'-6" below ceiling
c.	Wall Lighting Switches	4'-0"
d.	Motor Controllers	5'-0"
e.	Motor Push-button	4'-2"
f.	Telephone Outlets	As Directed by the Commissioner
g.	Fire Alarm Bells	8'-6"or 1'-6" below ceiling
h.	Fire Alarm Stations	4'-0"
i.	Intercom Outlet	1'-6"
j.	Cooking and Refrigerator Unit	As Directed

7. Outlet boxes must be of a design and construction approved by the Commissioner. The type of box, including its form and dimensions, must be appropriate for: its specific location; the kind of fixture to be used; and, the conduits (both quantity and type) that will connect to it. All ferrous outlet boxes must meet the requirements for zinc coating as specified under Electrical Conduit Systems.

8. Knockouts will only be opened to insert conduit. Any outlet boxes with more openings than are necessary for conduit insertion must be sealed by the Contractor without additional charge.

9. All outlet boxes and junction boxes for exposed work must be galvanized cast iron or cast aluminum with threaded openings. Outlet boxes for exposed inside work in damp locations must be galvanized cast iron or cast aluminum with threaded hubs and neoprene gaskets.

10. Junction boxes must not be less than 4 11/16" square and must be equipped with zinc coated plates. Where plates are exposed, they must be finished to match the room decor.

11. FIXTURE SUPPORTS: Outlet boxes supporting lighting fixtures must be equipped with fixture studs held by approved galvanized stove bolts or integral with the box. Cast iron or malleable boxes must have four (4) tapped holes for mounting required cover or fixtures.

12. Outlet boxes exposed to the weather or indicated W.P. must be cast iron or cast aluminum with the covers made watertight with neoprene gaskets. The boxes must have external lugs for mounting. Drilling of the body of the fitting for mounting will not be permitted. The cover screws must be appropriate in size, non-corrodible and not less than four (4) in number for each box opening.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3

3.3 ELECTRICAL WIRING DEVICES:

A. WALL SWITCHES: must be of the best specification grade, quiet type, and must have a rating of 20 Amperes at 277 volts, as manufactured by Bryant, Hubbell or approved equal. The mechanism must be equipped with arc snuffers. They must be of the tumbler type, single pole. Switches of the 3-way type must have a similar rating.

B. RECEPTACLES:

1. CONVENIENCE OUTLETS: must be of the best specification grade, duplex, two-pole, 3-wire, 20 Amperes at 125 volts. It must have a grounding pole that must be grounded to the conduit system. Receptacles must be capable of both back and side wiring and must have only one (1) grounding screw. Receptacles must be Hubbell Catalog #5262 or approved equal.

2. HEAVY DUTY RECEPTACLE OUTLETS: must have the Ampere rating and the number of poles specified on the Contract Drawings and must be Hubbell, Russell-Stoll, Bryant, AH & H or approved equal. Each outlet must have a grounding pole, which must be grounded to the conduit system.

3. FLOOR RECEPTACLES: must be Russell & Stoll #3040 or approved equal, to fit into floor box previously specified.

4. NAMEPLATES: are required for all receptacles other than 120V.

C. CLOCK HANGERS: Clock outlets for surface type clocks must be equipped with a supporting hook and recessed faceplate to conceal the electrical cord.

D. WATERTIGHT DEVICES: For installations exposed to weather or in damp locations, the devices must be in a gasketed, cast iron enclosure.

E. PLATES:

1. Every convenience outlet and switch outlet must be covered by means of a stainless steel No. 302 - 0.4" antimagnetic plate with an approved finish, unless provided otherwise in the detailed Specifications.

2. Where two (2) or three (3) switches are grouped together, a single faceplate must be used. Where more than three (3) switches are located at one (1) point, the faceplates may be made up in multiple units.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4

3.4 ELECTRICAL CONDUCTORS AND TERMINATIONS:

A. CONDUCTORS FOR LIGHT AND POWER: All wire and cable must be of annealed copper of 98% conductivity. Aluminum wire or cable will not be permitted. The insulation must be flame retardant, moisture and heat resistant, thermoplastic, type THW or THWN rated for 600 volts at 75 degrees Celsius (C.) for both wet and dry locations. Wires No. 8 or larger must be stranded. Wires and cables must also

be subject to the requirements of the NYCEC. Cables for incoming service, or wire in conduits contiguous with the earth, in concrete, or other damp or wet locations, must be synthetic rubber insulated with neoprene jacket, heat and moisture resistant and must be equal to UL Type USE and rated for 600 volts at 75 degrees C. for both wet and dry locations.

B. FIXTURE WIRE: Lighting fixtures must be wired with No. 14 gauge wire designated as AWM and rated at 105 degrees C.

C. OTHER TYPES: Cables and wires for interior communication systems are described in applicable detailed Specifications.

D. MINIMUM SIZE: Conductors smaller than No. 12 AWG must not be used for light or power.

E. COLOR CODE: Wires must have a phase color code, and multiple conductor cables must be color coded.

F. CABLE DATA: The Contractor must submit for approval the following information for each size and type of cable to be furnished:

1. Manufacture of Cable - Location of Plant.

2. Minimum insulation resistance at standard test temperature.

3. Days required for delivery to site of work after order to proceed with manufacture.

G. ORIGINAL REELS: Cable and wire must be delivered to the site of the work on original sealed factory reels.

H. WIRE INSTALLATION:

1. INSTALL WIRES AFTER PLASTERING: Feeder and branch circuits wiring must not be installed into conduit before the rough plastering work is completed. No conductors must be pulled into floor conduits before floor is poured.

2. CONDUIT SECURED IN PLACE: No conductor must be pulled into any conduit run before all joints are made up tightly and the entire run rigidly secured in place.

3. WIRE ENDS: All wires must be left with sufficiently long ends for proper connection and stowing.

4. PULLING COMPOUNDS: to ease the pulling-in of wires into the conduit, only approved compounds as recommended by cable manufacturers must be used.

5. PRESSURE CONNECTORS: pressure connectors for wires must be of the cast copper or forged copper pressure plate type. Connectors must be O.Z., Burndy, National Electric Products or approved equal.

6. Splices and feeder taps in the gutters of panel boxes must be made by means of pressure plate-type connectors encased in composition covers as manufactured by O.Z., Burndy, National Electric Products or approved equal.

7. Splices in branch wiring for sound systems and fire systems, must be first made mechanically secure, then soldered and taped.

8. In lieu of soldered splices (except for sound and fire systems, which must have soldered splices) the following alternates are acceptable for operating temperatures up to 105 degrees C., for fluorescent fixtures and for the splicing of branch circuit wiring up to No. 8 AWG wire:

a. Mechanical splices made with mechanical connectors as manufactured by the Minnesota Manufacturing Company "Scotchlock" or approved equal. Mechanical connectors requiring a special tool (pressure connectors, insulators and locking rings) by Buchanan or approved equal. The tool used for connector application must be as approved by the connector manufacturer.

b. For branch circuit wire and cable No. 6 AWG and larger, the seamless tubular connector will only be accepted. Application of this connector must be with a tool recommended by the connector manufacturer.

9. TAGS: All feeders and risers must be tagged at both ends, and in all pull and junction boxes and gutter spaces through which they pass. Such tags must be of fiber and have the feeder designation and size stamped thereon.

10. BRANCH CIRCUIT WIRING:

a. The Contractor installing branch circuit wiring must test the work for correct connections and leave all loop splices in the fixture outlet boxes properly spliced and taped. The Contractor must provide wire ends long enough for convenient connection to device.

b. NEUTRALS: No common neutrals must be used except for lighting branch circuits. Each neutral wire must be terminated separately on a neutral busbar in the panelboard. No common neutrals will be permitted for convenience receptacle branch circuits.

I. TERMINATIONS

1. LUGS: All lugs for all devices and all cable terminations must be copper. AL/CU rated lugs will not be permitted. The only exception to this requirement is when the particular device is not manufactured with copper lugs by any manufacturer. Lugs for No. 6 AWG cable and larger must be cast copper or forged copper pressure plate type. Lugs for 1/0 and larger must be fastened with two (2) bolts.

2. All lugs must be of the proper size to accept the cable connected to them. Any Subcontractor furnishing a device containing lugs is to coordinate with the Contractor to ensure that the device terminations are adequate for the wire or cable (whose size may be larger than expected due to voltage drop considerations) connected to the device.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.5

3.5 CIRCUIT PROTECTIVE DEVICES:

This Section sets forth the circuit protective devices such as circuit breakers and safety switches, used in connection with Motor Control Equipment, Distribution Centers, Panel boards and Service Entrance.

A. CIRCUIT BREAKERS:

1. CIRCUIT BREAKERS: must be operable in any position and must be of the quick-make, quick-break type on manual operation. The handle must be trip free, preventing contacts from being held in closed position against abnormal overloads or short circuits. Positive visual indication of automatic tripped position of breaker must be provided, in addition to the "On" and "Off" indication. All circuit breakers must be of the bolted type.

2. TRIP RATING: Circuit breakers must be provided with the required number of trip elements, calibrated at 40 degrees C., ambient temperature, in accordance with wire sizes or motor currents as shown on Contract Drawings or indicated in the Specifications.

3. POLE BARRIER: Multipole pole breakers must be designed to break all poles simultaneously. They must be provided with barriers between poles and arc suppressing devices.

4. ELEMENTS: Multipole circuit breakers must have frames of not less than a 100 Ampere rating. Multipole circuit breakers for 480 volts AC operation must have an NEMA interrupting rating of 18,000 Amperes, unless a higher rating is specified in the Specifications or indicated on the Contract Drawings.

5. For circuit breakers with frame size up to and including 225 Amperes, the breakers may be

provided with non-interchangeable trip elements. For frame ratings above 225 Amperes, the breakers must be provided with interchangeable trip elements, which can be replaced readily.

6. Single pole circuit breakers for branch circuits must have a frame size of no less than 100 Amperes and must be rated at 125 volt A.C. with a NEMA interrupting rating of 10,000 Amperes, unless a higher rating is specified in the Specifications or indicated on the Contract Drawings.

7. INVERSE TIME ACTION: The circuit breakers must be dual element type, one (1) element with time limit characteristics, so that tripping will be prevented on momentary overloads, but will occur before dangerous values are reached and the other with instantaneous trip action. Inverse time delay action must be effective between a minimum tripping point of 125% of rating of breaker and an instantaneous tripping point between 600% and 700% of rated current.

8. CONSTANCY OF CALIBRATION: The tripping elements must ensure constant calibration and be capable of withstanding excessive short circuit conditions without injury.

9. CONTACTS: must be non-welding under operating conditions and of the silver to silver type.

10. TEMPERATURE RISE: Current carrying parts, except thermal elements, must not rise in temperature in excess of 30 degrees C. while carrying current at the part's rated current and frequency.

11. NUMBERING: Each circuit breaker must be distinctly numbered when installed in a group with other breakers. The calibration of trip element must be indicated on each breaker.

B. SAFETY SWITCHES:

NEMA TYPE HD: When safety switches are permitted to be used for service entrance, motor disconnecting means or to control other types of electrical equipment, they must be of the type HD of a rating not less than 30 Amperes. Enclosures must be provided with means for locking. For ratings above 60 Amperes terminals must have double studs.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.6

3.6 DISTRIBUTION CENTERS:

This Section sets forth the construction and installation procedure for Switchboards, Panel boards and Cabinets.

A. PANEL BOARDS, GENERAL TYPE: The panel boards must be of the automatic circuit breaker type with individual breakers for each circuit, removable without disturbing the other units. Circuit breakers must be in accordance with the requirements outlined under Section 3.5, "Circuit Protective Devices."

B. NUMBER AND RATING OF CIRCUIT BREAKERS: The Contract Drawings show a layout of each panel, giving the number, frame, size and trip setting of circuit breakers and number of branch circuits and spare breakers. Each branch circuit must be distinctly numbered.

C. BUS BAR CONSTRUCTION AND SUPPORT: Panel Boards must be of the dead front type and must have bus bars and branch circuits designed to suit the system and voltage. Current carrying parts, exclusive of circuit breakers, must be copper and based on a maximum density of 1,000 Amperes per square inch. Bus bars for the main switchboard must be designed for the frame rating of the Service Breaker. Bus bars must run up the center of the panel, unless otherwise indicated, and must have connected thereto the various branch circuits. Unless otherwise specified, bus bars for each panel board must be equipped with main lugs only and capacity as required on Contract Drawings. Where main protection is required, automatic circuit breakers must be used. A neutral bus of at least the same capacity as a live bus bar must be provided for the connection of all neutral conductors. Each terminal must be identified. All current carrying parts, exclusive of circuit breakers, must be of copper with a minimum number of joints. The bus bar structure must be a self-supporting unit, firmly fastened to a ½

inch plastic board, extending the full length and width of assembly which must serve to insulate the bus structure from the back of panel box. Other methods affording equally effective bus structure support and insulation will be given consideration. An insulating barrier must separate neutral bus from other parts of panel.

D. CIRCUIT BREAKER ASSEMBLY: The entire circuit breaker and bus bar assembly must be mounted on an adjustable metal base or pan and secured to the back of the panel box. The panel must have edges flanged for rigidity.

E. PANEL MOUNTING: The panel must be centered in the panel box, line up with the door openings, be set level and plumb, and no live parts may be exposed with the door open.

F. PANEL CABINET:

1. PANEL CABINET INSTALLATION: When installed, surface mounted in panel closets must be mounted on Kindorf channel.

2. Where cabinets cannot be set entirely flush due to mustow walls or partitions or where cabinet is extra deep, the protruding sides of cabinet must be trimmed with a metal or hardwood return molding of approved design and fastened to cabinet so as to conceal the intersection between the wall and cabinet.

G. NAMEPLATES: Where required, nameplates must be made of engraved Lamicoid sheet, or approved equal. Letters and numbers must be engraved white on a black background (except for Firehouse projects which must have white letters on a red background). The Contractor must submit an engraved sample for approval as to design and style of lettering before proceeding with the manufacture of the nameplate. Nameplates must be of suitable size and must also be provided at the top of the switchboard or section thereof and on the trim at the top of all lighting and power panels. Similar nameplates must also be provided for each distribution circuit breaker giving the breaker number, the number of the feeder, and the name of the equipment fed.

H. SHOP DRAWINGS: showing all details of boxes, panels, etc., must be submitted for approval.

I. DIRECTORIES: A directory must be fastened with brass screws and consist of a noncorrosive metal frame with dimensions not less than five (5) inches x eight (8) inches and a transparent window of Plasticile, Plexiglass, Lucite, Polycarbonate or approved equal that is not less than 1/16 inch thick over cardboard or heavy paper. The directory must be typewritten and show the number and name of each circuit, and lighting or equipment supplied. The size of riser feeder must be as indicated on the directory. The dimensions of the directory must be submitted for approval for each size of panel.

J. CONSTRUCTION

1. FINISH: Panel boxes, doors and trim for installation in dry locations, must be zinc coated after fabrication by the hot-dip galvanizing or electroplate process on inside and outside surfaces. In damp locations, panel boards must be enclosed and gasketed NEMA 3R type. Panel boards located outdoors or exposed to the weather must be NEMA 3X type.

2. PAINTING: Panel boxes, doors and trim must receive a coat of approved priming paint and a second coat of approved paint in the field after installation. Paint must be applied to the inside and outside of boxes and on both sides of trim. Panel trims and doors must receive a third or finishing coat on the outside after installation. Approval as to texture and color must be obtained before the final coat is applied.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.7

3.7 MOTORS:

This Section sets forth the general design, construction and performance requirements, which must apply to all motors furnished in the Contract.

A. MOTOR DESIGN: All motors must be designed to comply with the New York State Energy Conservation Construction Code and the New York City Energy Conservation Code. In the event of any conflict or inconsistency between such codes, the New York City Energy Conservation Code must prevail. Motors must have standard NEMA frames and must have nameplate ratings adequate to meet the specified conditions of operation. Motor performance under variable conditions of voltage and frequency must be within the limits set in NEMA standards, unless modified in the Specifications. Motors must be expressly designed for the hazard duty load, voltage and frequency as specified in the Contract. All motor windings must be copper. All motors intended to operate on a 208 volt system must be designed and rated for 200 volts.

B. STANDARDS OF COMPARISON: In the absence of specific motor specifications, in general, the best standard products of the leading motor manufacturers must be considered as a standard for comparison. The requirements of the NEMA standards for motors and generators must be deemed to contain the minimum requirements of performance and design.

C. OBJECTIONABLE NOISES: Objectionable noises will not be tolerated and exceptionally quiet motors may be required for certain specified locations. Noise control tests as per the New York City Construction Codes may be performed as directed by the Commissioner. Such motors must bear a nameplate lettered "Quiet Motor." Springs and slip rings must be of approved non-ferrous material.

D. BEARINGS:

1. Bearings, unless specified otherwise, must be of the ball or roller type. Motors one (1) horsepower and larger that are equipped with ball roller bearings must also have lubrication of the pressure-relief greasing type. The Contractor furnishing four (4) or more such motors must also furnish, as part of the Contract, a pressure grease gun of rugged design, of approximately ten (10) ounce capacity, complete with necessary adapters. The Contractor must also provide ten (10) pounds of approved gun grease.

2. For any particular unit where sleeve bearings are deemed desirable, permission for their use may be granted by the Commissioner. Motors one (1) horsepower and larger that are equipped with sleeve type bearings must, in addition to having protected fittings easily accessed for oiling, be provided with visible means for determining normal oil level. Lubrication must be positive, automatic and continuous.

E. MOTOR TERMINALS AND BOXES: Each motor must be furnished with flexible leads of sufficient length to extend for a distance of not less than three (3) inches beyond the face of the conduit terminal box. This box must be furnished of ample size to make and house motor connections. These requirements must be met irrespective of any other standards or practices. Size of cable terminals and conduit terminal box holes must be subject to approval. For motors five (5) horsepower or larger, each terminal must come with two (2) cast or forged copper pressure type connectors with bolts, nuts and washers. For motors of smaller ratings, connectors of other acceptable types may be furnished. For installations exposed to the weather or moist locations, terminal boxes must be of cast iron with threaded hubs and gasketed covers. Cover screws must be of non-corrosive material.

F. MOTOR TEMPERATURE RISES: The motor nameplate temperature rises for the various types of motor enclosures must be as listed below:

1.	Open Frame	40 degrees C.
2.	Totally enclosed and enclosed fan cooled	55 degrees C.
3.	Explosion proof and submersible	55 degrees C.

4. Partially enclosed and drip proof 40 degrees C.

The temperature of the various parts of a motor must meet the requirements of NEMA standards for the size and type of the motors. Tests for heating must be made by loading the motor to its rated horsepower and keeping it so loaded for the rated time interval or until the temperature becomes constant.

G. SPECIAL CODE INSTALLATIONS: Electrical installations covered by special publications of NBFU and by special City rulings and regulations must comply in design and safety features with such applicable codes, regulations and rulings, and must be furnished and installed complete with all accessories and safety devices as therein specified.

H. MOTORS ON LIGHTING PANELS: The largest A.C. motor permitted on branch circuits of lighting panels must not exceed 1/4 horsepower.

I. MOTORS RATED: ½ horsepower and larger must be polyphase.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8

3.8 MOTOR CONTROL EQUIPMENT:

This Section sets forth the requirements for motor controllers and associated devices. Such requirements are applicable to all motor control equipment furnished or installed.

A. MANUFACTURER: All control equipment furnished under the Contract must be the product of a single manufacturer. Exceptions to this rule may be granted in the case of controllers for fractional horsepower motors driving special equipment, the various units of which have been engineered to obtain specific performance.

B. CONTROL ITEMS REQUIRED: The Contractor furnishing motors must also furnish therewith complete disconnecting, starting and control equipment as required by the detailed Specifications, the various code authorities and for the successful operation of the driven equipment. These items include circuit breakers, magnetic starters with overload protection and low voltage release or protection, push button stations, pilot lights and alarms, float, pressure, temperature and limit switches, load transfer switches, devices for manual operation and speed controllers, etc. The Contractor must furnish as many of these items as required for the successful operation of the driven unit.

1. Where a motor is to be located out of sight of the controller, the Contractor must furnish an approved disconnecting means to be mounted near motor.

C. TYPES OF STARTERS:

1. SQUIRREL CAGE: A.C. motors of the squirrel cage type, rated from one (1) to thirty (30) horsepower, must have magnetic across the line starters; motors rated above thirty (30) horsepower must be furnished with reduced voltage (autotransformer type) starter or part winding start with time delay to reduce inrush current. Size of starters must be based on 200V operation.

2. SLIP RING: A.C. motors of the slip-ring type must be furnished with primary across the line starters interlocked with secondary starting and regulating equipment. The interlocking feature must prevent starting of the motor when the secondary controller is off the initial starting point.

3. MAGNETIC: For fractional horsepower motors, magnetic type starters are not required unless the particular method of controlling the driven equipment makes them necessary. Where individual single phase fractional horsepower motors or the sum of fractional horsepower motors controlled by an automatic device are ½ horsepower or more, magnetic starters and circuit breakers must be used. Single phase A.C. motors smaller than ½ horsepower or three-phase A.C. motors smaller than one (1) horsepower where manual control is specified may be furnished with starters of toggle switch or push button type with inbuilt thermal protection. No additional disconnecting means is required to be furnished with this type of starter. This type of starter may also be used in series

with automatic control devices such as thermostats, float and pressure switches, provided the individual motor or the sum of fractional horsepower motors is less than ½ horsepower. Means for manual operation must be provided.

D. DISCONNECTING BREAKER: All motor starters, unless otherwise specified, must be provided with a disconnecting means in the form of a circuit breaker of the type specified under Article 3.5 CIRCUIT PROTECTIVE DEVICES. This disconnecting means must be contained in the same housing with the starter and must be operable from outside. Means must be provided for locking the handle of the circuit breaker in the "OFF" position if it is desired to take the equipment out of service and prevent unauthorized starting.

E. CONTROL CABINET – DRY LOCATIONS: All starters must be furnished with general purpose, NEMA Type 1, sheet metal enclosures with hinged covers and baked enamel finish.

F. CONTROL CABINET – WATERTIGHT: In wet locations, cast iron watertight enclosures with threaded hubs, galvanized and gasketed hinged covers must be provided.

G. PANELS: Motor control devices and appliances must be mounted on approved insulating slabs with all wiring and connections made on the back of the slabs.

H. WIRING AND TERMINALS: Wiring connections for currents of one hundred (100) Amperes or less may be made with copper wire or cable with special flameproof insulating coverings. Such wires must be installed in a neat workmanlike manner, flat against the slab, and held in place by clips. Connections must be made with pressure connectors for No. 8 AWG and larger wires, and with grommets for small, stranded wires. Except for incoming and outgoing main leads, all connections must terminate on approved connector blocks, which may be installed on the face of the slab. For small, across the line starters, the above requirements may be modified if satisfactory connections are provided.

I. COPPER BUS: For currents exceeding one hundred (100) Amperes, copper bus must be used in place of wires. The bus must be constructed of copper rods, tubing or flat strap, bent and shaped properly and securely attached to the slab in a neat and workmanlike manner. The cross section of copper must provide sufficient areas to keep current density at not more than one thousand (1,000) Amperes per square inch.

J. COOPERATION: The Contractor's Subcontractor(s) who furnish electrically operated equipment must give to the Contractor and the Contractor's electrical Subcontractor full information relative to sizes and locations of apparatus furnished by them which require electrical connections.

END OF SECTION 01 35 06

SECTION 01 35 26
SAFETY REQUIREMENTS PROCEDURES

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. The Contractor shall comply with the requirements of "*The City of New York Department of Design and Construction Safety Requirements".* This document is included in the Information for Bidders.

1.2 SUMMARY:

A. This Section includes administrative and general procedural requirements for Safety and Health Requirements, including:

1. Definitions
2. Required Safety Meeting
3. Compliance with Regulations
4. Submittals
5. Personnel Protective Equipment
6. Hazardous and / or Contaminated Materials
7. Emergency Suspension of Work
8. Protection of Personnel
9. Environmental Protection

1.3 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" must mean the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.4 REQUIRED SAFETY MEETINGS:

A. Prior to commencing construction, the Resident Engineer will schedule and hold a preconstruction kick-off meeting either at DDC's main office or at the Project site with representatives of the Contractor, including the principal on-site project representative, one or more safety representatives, the Commissioner's designated representatives and other concerned parties for the purpose of reviewing the Contract safety requirements. Additionally, implementing Work safety provisions must be discussed.

B. The Contractor is responsible for conducting weekly documented jobsite safety meetings, given to all jobsite personnel including all Subcontractors on the Project, with the purpose of discussing safety topics and job-specific requirements at the DDC worksite.

1.5 COMPLIANCE WITH REGULATIONS:

A. The Work, including contact with or handling of hazardous materials, disturbance or dismantling of structures containing hazardous materials, and disposal of hazardous materials, shall comply with the applicable requirement for 29 CFR Parts 1910 and 1926, and 40 CFR, Parts 61, 261, 761 and 763.

B. Work involving disturbance or dismantling of asbestos or asbestos-containing materials, demolition of structures containing asbestos and removal of asbestos, shall comply with 40 CFR Part 61, Subparts A and M, and 40 CFR Part 763, as applicable.

C. Additionally, Work shall comply with all applicable federal, state, and local safety and health regulations.

D. In case of a conflict between applicable regulations, the more stringent requirements shall apply.

E. All workers working on the DDC Project site are required by NYC Local Law 41 to complete the OSHA 10-hour training course.

1.6 SUBMITTALS:

A. The Contractor shall submit to the Resident Engineer, copies of the Safety Program, Site Safety Plan and other required documentation in accordance with the "*New York City Department of Design and Construction Safety Requirements*".

B. Permits: If hazardous materials are disposed of off-site, the Contractor must submit to the Resident Engineer copies of shipping manifests, permits from applicable federal, state, or local authorities and disposal facilities, and certificates that the material has been disposed of in accordance with regulations.

C. Accident Reporting: Submit a copy of each accident report to the Resident Engineer in accordance with the "*New York City Department of Design and Construction Safety Requirements*".

D. All asbestos and lead project regulatory notifications are to be submitted to DDC's Office of Environmental and HazMat Services (OEHS) through the Resident Engineer.

E. Request for Subcontractor Approval: Any Subcontractor performing environmental work must submit required documentation for approval to perform such work as required by DDC's OEHS.

PART II – PRODUCTS

2.1 PERSONNEL PROTECTIVE EQUIPMENT:

A. Special facilities, devices, equipment, and similar items used by the Contractor in execution of the Work shall comply with 29 CFR Part 1910, subpart I, Part 1926, subpart E, and other applicable regulations.

2.2 HAZARDOUS AND / OR CONTAMINATED MATERIALS:

A. The Contractor shall bring to the attention of the Commissioner, any material encountered during execution of the Work that the Contractor suspects to be hazardous and / or contaminated.

B. The Commissioner shall determine whether the Contractor shall perform tests to determine if the material is hazardous and / or contaminated. A change to the Contract price may be provided, subject to the applicable provisions of the Contract.

C. If the material is found to be hazardous, the Commissioner may direct the Contractor to remediate the hazard and a change to the Contract price may be provided, subject to the applicable provisions of the Contract.

PART III – EXECUTION

3.1 EMERGENCY SUSPENSION OF WORK:

A. When the Contractor is notified by the Commissioner of noncompliance with the safety provisions of the Contract, the Contractor shall immediately, unless otherwise instructed, correct the unsafe condition, at no additional cost to the City.

B. If the Contractor fails to comply promptly, all or part of the Work may be stopped by notice from the Commissioner.

C. When, in the opinion of the Commissioner, theContractor has taken satisfactory corrective action, the Commissioner shall provide written notice to the Contractor that the Work may resume.

D. The Contractor shall not be allowed any extension of time or compensation for damages in connection with a work stoppage for an unsafe condition.

3.2 PROTECTION OF PERSONNEL:

A. The Contractor shall take all necessary precautions to prevent injury to the public, occupants, or damage to property of others. The public and occupants includes all persons not employed by the Contractor or a Subcontractor.

B. Whenever practical, the work area shall be fenced, barricaded, or otherwise blocked off from the public or occupants to prevent unauthorized entry into the work area, in compliance with the requirements of Section 01 50 00 TEMPORARY FACILITIES, SERVICES AND CONTROLS, and including without limitation, the following:

1. Provide traffic barricades and traffic control signage where construction activities occur in vehicular areas.
2. Corridors, aisles, stairways, doors, and exit ways shall not be obstructed or used in a manner to encroach upon routes of ingress or egress utilized by the public or occupants, or to present an unsafe condition to the public or occupants.
3. Store, position and use equipment, tools, materials, scraps and trash in a manner that does not present a hazard to the public or occupant by accidental shifting, ignition, or other hazardous activity.
4. Store and transport refuse and debris in a manner to prevent unsafe and unhealthy conditions for the public and occupants. Cover refuse containers and remove refuse on a frequent regular basis acceptable to the Resident Engineer. Use tarpaulins or other means to prevent loose transported materials from dropping from trucks or other vehicles.

3.3 ENVIRONMENTAL PROTECTION:

A. Dispose of solid, liquid and gaseous contaminants in accordance with local codes, laws, ordinances and regulations.

B. Comply with applicable federal, state, and local noise control laws, ordinances, and regulations, including but not limited to 29 CFR 1910.95, 29 CFR 1926.52 and NYC Administrative Code Chapter 28 of Title 15.

END OF SECTION 01 35 26

SECTION 01 35 91
HISTORIC TREATMENT PROCEDURES

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 35 91

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes administrative and procedural requirements for the treatment of Landmark Structures and Landmark Quality Structures, as identified in the Addendum. Specific requirements are indicated in other sections of the Specifications.

B. This Section includes, without limitation, the following:

1. Storage and protection of existing historic materials
2. General Protection
3. Protection during use of heat-generating equipment
4. Photographic Documentation
5. NYC Landmarks Preservation Commission Final Approval signoffs

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION
C. Section 01 33 00 SUBMITTAL PROCEDURES
D. Section 01 77 00 CLOSEOUT PROCEDURES
E. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: “Design Consultant” means the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the “Design Consultant” may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

C. Landmark Structure or Site: Any building or site which has been designated as a landmark, or any building or site within a landmark district, as designated by the New York City (NYC) Preservation Commission or the New York State Historic Preservation Office.

D. Landmark Quality Structure: Any building which has been determined by the City to be of landmark quality and/or historical significance.

E. Preservation: To apply measures necessary to sustain the existing form, integrity, and materials of a historic property. Work may include preliminary measures to protect and stabilize the property.

F. Rehabilitation: To make possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, or architectural values.

G. Restoration: To accurately depict the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and the reconstruction of missing features from the restoration period.

H. Reconstruction: To reproduce in the exact form and detail a building, structure, or artifact as it appeared at a specific period in time.

I. Stabilize: To apply measures designed to reestablish a weather-resistant enclosure and the structural reinforcement of an item or portion of the building while maintaining the essential form as it exists at present.

J. Protect and Maintain: To remove deteriorating corrosion, reapply protective coatings, and install protective measures such as temporary guards; to provide the least degree of intervention.

K. Repair: To stabilize, consolidate, or conserve; to retain existing materials and features while employing as little new material as possible. Repair includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials. Within restoration, repair also includes limited replacement in kind, rehabilitation, and reconstruction, with compatible substitute materials for deteriorated or missing parts of features when there are surviving prototypes.

L. Replace: To duplicate and replace entire features with new material in kind. Replacement includes the following conditions:

1. Duplication: Includes replacing elements damaged beyond repair or missing. Original material is indicated as the pattern for creating new duplicated elements.
2. Replacement with New Materials: Includes replacement with new material when original material is not available as patterns for creating new duplicated elements.
3. Replacement with Substitute Materials: Includes replacement with compatible substitute materials. Substitute materials are not allowed, unless otherwise indicated.

M. Remove: To detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

N. Remove and Salvage: To detach items from existing construction and deliver them to the City ready for reuse.

O. Remove and Reinstall: To detach items from existing construction, repair and clean them for reuse, and reinstall them where indicated.

P. Existing to Remain or Retain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed and salvaged, or removed and reinstalled.

Q. Material in Kind: Material that matches existing materials as much as possible, in species, cut, color, grain, and finish.

1.5 SUBMITTALS:

A. Historic Treatment Program: Submit a written plan for each phase or process, including protection of surrounding materials during operations. Describe in detail materials, methods, and equipment to be used for each phase of the Work.

B. Alternative Methods and Materials: If alternative methods and materials to those indicated are proposed for any phase of the Work, submit for the Commissioner's approval a written description, including

evidence of successful use on other comparable projects and provide a program of planned testing to demonstrate the effectiveness of the alternative methods and materials for use on this Project.

C. Qualification Data: Submit qualification data for historic treatment specialists as specified and required by individual sections of the Project specifications.

D. Photographs for Designated Landmark Structures: Submit photographs in accordance with Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION and as described in this section.

E. Record Documents: Include modifications to manufacturer's written instructions and procedures, as documented in the historic treatment preconstruction conference and as the Work progresses.

1.6 QUALITY ASSURANCE:

A. Historic Treatment Specialist Qualifications: Refer to Section 01 40 00 QUALITY REQUIREMENTS for Qualifications for Historic Treatment Specialists.

B. Historic Treatment Preconstruction Conference: The Resident Engineer will schedule and hold a preconstruction meeting at the site in accordance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION.

1. Review manufacturer's written instructions for precautions and effects of products and procedures on building materials, components, and vegetation.

a. Record procedures established as a result of the review and distribute to affected parties.

1.7 STORAGE AND PROTECTION OF HISTORIC MATERIALS:

A. Removed and Salvaged Historic Materials: As specified and required by individual sections of the Project specifications.

B. Removed and Reinstalled Historic Materials: As specified and required by individual sections of the Project specifications.

C. Existing Historic Materials to Remain: Protect construction indicated to remain against damage and soiling during historic treatment. When permitted by the Commissioner, items may be removed to a suitable, protected storage location during historic treatment and reinstalled in their original locations after historic treatment operations are complete.

D. Storage and Protection: When removed from their existing location, store historic materials, at a location acceptable to the Commissioner, within a weather tight enclosure where they are protected from wetting by rain, snow, or ground water, and temperature variations. Secure stored materials to protect from theft.

1. Identify removed items with an inconspicuous mark indicating their original location.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 GENERAL PROTECTION:

A. Comply with manufacturer's written precautions against harmful effects of products and procedures on adjacent building materials, components, and vegetation.

B. Ensure that supervisory personnel are present when work begins and throughout its progress.

C. Temporary Protection of Historic Materials during Construction:

1. Protect existing materials during installation of temporary protections and construction. Do not deface or remove existing materials.

2. Attachments of temporary protection to existing construction must be approved by the Commissioner prior to installation.

D. Protect landscape work adjacent to or within work areas as follows:

1. Provide barriers to protect tree trunks.
2. Bind spreading shrubs.
3. Use coverings that allow plants to breathe and remove coverings at the end of each day. Do not cover plant material with a waterproof membrane for more than eight (8) hours at a time.
4. Set scaffolding and ladder legs away from plants.

E. Existing Drains: Prior to the start of work or any cleaning operations, test drains and other water removal systems to ensure that drains and systems are functioning properly. Notify the Commissioner immediately of drains or systems that are stopped or blocked. Do not begin Work pertaining to this Section until the drains are in working order.

1. Provide a method to prevent solids, including stone or mortar residue, from entering the drains or drain lines. Clean out drains and drain lines that become blocked or filled by sand or any other solids because of the Work performed under this Contract.
2. Protect storm drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

3.2 PROTECTION DURING USE OF HEAT-GENERATING EQUIPMENT:

A. No roofing work requiring the use of an open flame will be permitted on any Landmark Structure or any Landmark Quality Structure whose roof or wall structure is made of wood or primarily of wood.

B. Comply with the following procedures while performing work with heat-generating equipment, including welding, cutting, soldering, brazing, paint removal with heat, and other operations where open flames or implements utilizing heat are used:

1. Obtain Commissioner's approval for operations involving use of open-flame or welding equipment. Notification must be given for each occurrence and location of work with heat-generating equipment.
2. Where possible, use heat-generating equipment in shop areas or outside the building.
3. Before work with heat-generating equipment commences, furnish personnel to serve as a fire watch (or watches) for location(s) where work is to be performed.
4. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.
5. Remove and keep the area free of combustibles, including rubbish, paper, waste, etc., within the area of operations.
6. If combustible material cannot be removed, provide fireproof blankets to cover such materials.
7. Where possible, furnish and use baffles of metal or gypsum board to prevent the spraying of sparks or hot slag into surrounding combustible material.
8. Prevent the extension of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
9. Inspect each location of the day's work not sooner than thirty (30) minutes after completion of operations to detect hidden or smoldering fires and to ensure that proper housekeeping is maintained.

C. Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to automatic sprinkler heads, shield the individual heads temporarily with guards.

3.3 PHOTOGRAPHIC DOCUMENTATION:

A. Photographs for Designated Landmark Structures: Show existing conditions prior to any historic treatments, including one overall photograph and two close-up photographs of all areas of work affected. Show one overall photograph and two close-up photographs of all areas of work after the successful execution of all historical treatments.

3.4 NEW YORK CITY LANDMARKS PRESERVATION COMMISSION FINAL APPROVALS SIGNOFF:

A. For all projects involving a Landmark Structure or Site, the Contractor, at the completion of the Work, must submit to the Commissioner, in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS, all documentation concerning the successful execution of all historic treatments. This must include, but not be limited to, copies of all before and after photographs of historic treatments, one copy of the GC Contractor's as-built drawings, copies of testing and analysis results, including cleaning, mortar analysis, pointing mortars and all other information pertaining to work performed under the NYC Landmarks Preservation Commission jurisdiction.

END OF SECTION 01 35 91

SECTION 01 40 00
QUALITY REQUIREMENTS

PART I - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes the following:

1. Definitions
2. Engineering Services
3. Conflicting Requirements
4. Quality Assurance
5. Quality Control
6. Approval of Materials
7. Special Inspections (Controlled Inspection)
8. Inspections by Other City Agencies
9. Certificates of Approval
10. Acceptance Tests
11. Repair and Protection

B. This section includes administrative and procedural requirements for quality control to assure compliance with quality requirements specified in the Contract Documents.

C. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Documents.

D. Specified tests, inspections, and related actions do not limit Contractor's other quality assurance and quality control procedures that facilitate compliance with the Contract Documents.

E. Provisions of this section do not limit requirements for the Contractor to provide quality assurance and quality control services required by the Commissioner or authorities having jurisdiction.

F. Specific test and inspection requirements are specified in the individual sections of the Specifications.

G. LEED: Refer to the Addendum to identify whether the Project is designed to comply with a Certification Level according to the U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) Rating System, as specified in Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.

H. COMMISSIONING: Refer to the Addendum to identify whether the Project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning must be in accordance with ASHRAE and USGBC LEED-NC procedures, as described in Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS and/ or Section 01 91 15 GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE. The Contractor must cooperate with the Commissioning Agent and provide whatever assistance is required.

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY

B. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION

C. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION

D. Section 01 33 00 SUBMITTAL PROCEDURES

E. Section 01 77 00 CLOSEOUT PROCEDURES

F. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. Design Consultant: "Design Consultant" means the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (Drawings and Specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

C. Commissioning: A Total Quality Assurance process that includes checking the design and installation of equipment, as well as performing functional testing of the same to confirm that the installed equipment is operating and in conformance with the Contract Documents and the City's requirements.

D. Experienced: When used with an entity or individual, "experienced," means having minimum experience levels as described in Article 1.7, Paragraph B "Minimum Experience qualification levels."

E. Installer/ Applicator/ Erector: Contractor or another entity engaged by Contractor as an employee or Subcontractor, to perform a particular construction operation, installation, erection, application, assembly and similar operations.

F. Mockups: Full-size physical assemblies that are constructed on-site either as freestanding temporary built elements or as part of permanent construction. Mockups are constructed to verify selections made under sample Submittals; to demonstrate aesthetic effects and qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

G. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

H. Product Tests: Tests and inspections that are performed by a Nationally Recognized Testing Laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

I. Source Quality-Control Tests: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.

J. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory means the same as testing agency.

K. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

L. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements.

1.5 ENGINEERING SERVICES

A. Performance and Design Criteria: Where professional design services provided by a professional engineer are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are insufficient to perform services or certification required, submit a written request for clarification to the Commissioner.

1.6 CONFLICTING REQUIREMENTS:

A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, the Contractor must comply with the most stringent requirement. The Contractor must refer any uncertainties and/or conflicting requirements to the Commissioner for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified must be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. The Contractor must refer any uncertainties to the Commissioner for a decision before proceeding.

1.7 QUALITY ASSURANCE:

A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required. Individual Specification Sections may specify supplementary qualification requirements.

1. **Minimum Experience**: Minimum Experience qualification levels as described herein, apply to all entities indicated in the Specification Sections for the Project, unless such entity requires Special Experience requirements per Subsection 1.7 A.2. below. Individual Specification Sections may specify supplementary qualification requirements.

2. **Special Experience**: Special Experience qualification levels as described herein, apply to all entities indicated in the "Special Experience Requirements" page of the PASSPort procurement. Individual Specification Sections may specify supplementary qualification requirements.

B. **Minimum Experience qualification levels:**

1. **Qualifications for Installer or Applicator or Erector**: An entity complying with the requirements of authorities having jurisdiction and having, prior to the bid opening, been regularly engaged for a minimum of three (3) consecutive years in installing, erecting, applying, or assembling work in a timely fashion similar in material, design, and extent to that indicated for the Project, and whose

work has resulted in construction with a record of successful in-service performance

2. **Qualifications for Installer or Applicator or Erector requiring approval or certification or authorization by Manufacturer**: An entity complying with the requirements of authorities having jurisdiction and having, prior to the bid opening, been regularly engaged for a minimum of three (3) consecutive years in installing, erecting, applying, or assembling work in a timely fashion similar in material, design, and extent to that indicated for the Project, and whose work has resulted in construction with a record of successful in-service performance. In addition, the entity must be approved, or certified, or authorized by the manufacturers listed in the Specification Section and must be eligible to receive manufacturers' warranty.

3. **Qualifications for Fabricator**: An entity complying with the requirements of authorities having jurisdiction; having, prior to the bid opening, been regularly engaged for a minimum of three (3) consecutive years in producing products similar to those indicated for the Project and having a record of successful in-service performance, as well as sufficient production capacity to produce required units.

4. **Qualifications for Manufacturer**: An entity complying with the requirements of authorities having jurisdiction; having, prior to the bid opening, been regularly engaged for a minimum of three (3) consecutive years in manufacturing products or systems similar to those indicated for the Project; having a record of successful in-service performance for not less than three (3) consecutive years and having sufficient production capacity to produce required units. Manufacturer must meet warranty requirements and technical or factory-authorized service representative requirements.

5. **Qualifications for Specialist:** An entity complying with the requirements of authorities having jurisdiction; satisfying qualification requirements indicated in the Specification Section and having, prior to the bid opening, a minimum of three (3) consecutive years successfully engaged in the activities indicated.

C. **Special Experience Qualification Levels:**

1. **Special Qualifications for Installer or Applicator or Erector**: An entity complying with the requirements of authorities having jurisdiction and having, prior to the bid opening, been regularly engaged for a minimum of five (5) consecutive years in successfully installing, erecting, applying, or assembling work similar in material and design to that indicated for the Project. Entity must provide documentation of having successfully completed a minimum of three (3) projects similar in scope, size and type as required for the Project.

2. **Special Qualifications for Fabricator**: An entity complying with the requirements of authorities having jurisdiction; having, prior to the bid opening, been regularly engaged for a minimum of five (5) consecutive years in producing products similar to those indicated for the Project; having a record of successful in-service performance, as well as sufficient production capacity to produce required units. Entity must provide documentation of having successfully completed a minimum of three (3) projects similar in nature, size, and extent, to the requirements of the project.

3. **Special Qualifications for Installer of a Manufacturer-Warrantied Roof System:** An entity complying with the requirements of authorities having jurisdiction; regularly engaged in performing roofing projects with its own workforce; having successfully completed in a timely fashion within the last three (3) consecutive years prior to the bid opening, at least three (3) roofing projects similar in scope, size and type to the required Project, and having performed at least one (1) of those projects in the last twelve (12) months. The three (3) qualifying projects must have utilized one or more of the roofing systems specified for the project being bid herein,

been installed by the entity utilizing its own workforce and must have qualified for, and have been issued, the warranty provided by the manufacturer of the roofing system. In addition, the entity must be a certified or authorized installer for the manufacturer's roofing systems specified herein and must submit proof of same.

4. **Special Qualifications for Installer of Roof tie-in to maintain existing Roof System Warranty:** An entity complying with the requirements of authorities having jurisdiction; regularly engaged in performing roofing projects with its own workforce; having successfully completed in a timely fashion within the last three (3) consecutive years prior to the bid opening, at least three (3) roofing projects similar in scope, size and type to the required Project, and having performed at least one (1) of those projects in the last twelve (12) months. The three (3) qualifying projects must have utilized the manufacturer and manufacturer's Product, been installed by the entity utilizing its own workforce and must have qualified for, and have been issued, the warranty provided by the manufacturer listed in the technical specification. In addition, the entity must be a certified or authorized installer for this manufacturer's specified roofing system specified herein and must submit proof of same.

5. **Special Qualifications for Manufacturer:** An entity complying with the requirements of authorities having jurisdiction; having, prior to the bid opening, been regularly engaged for a minimum of five (5) consecutive years in manufacturing products or systems similar to those indicated for the Project; having completed a minimum of three (3) projects similar in nature, size, and extent, to the requirements of the project; having a record of successful in-service performance, as well as sufficient production capacity to produce required units. Manufacturer must meet warranty requirements, and technical or factory-authorized service representative requirements.

6. **Special Qualifications for Historic Treatment Specialist:** An entity complying with the requirements of authorities having jurisdiction and having prior to the bid opening, been regularly engaged for a minimum of five (5) consecutive years in successfully completing in a timely fashion project similar in scope, size, and type to the required work, based on architectural style, construction method and materials and age of building for the project. Entity must provide documentation of having successfully completed a minimum of three (3) projects similar in scope, size and type as required for the Project, and where at least one (1) such prior project of the three (3) must have involved a landmarked building, as officially designated by the City, State, or Federal government.

D. Professional Engineer Qualifications: A professional engineer who is licensed and registered to practice in the State of New York and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar to those indicated for the Project in material, design, and extent.

E. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for the Project.

F. Testing Agency Qualifications: A Nationally Recognized Testing Laboratory (NRTL), a National Voluntary Laboratory Accreditation Program (NVLAP), or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented according to ASTM E329 (Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection); and with additional qualifications specified in individual Specification Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

G. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:

   a. Provide test specimens representative of proposed products and construction.
   b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
   c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
   d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
   e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
   f. When testing is complete, remove test specimens and test assemblies, and mockups, and laboratory mockups; do not reuse products on Project.

2. Testing Agency Responsibility: Submit a certified written report of each test, inspection, and similar quality-assurance service to Commissioner, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

H. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by the Commissioner.
2. Notify Commissioner seven (7) days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Commissioner's approval of mockups before starting work, fabrication, or construction.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed, unless otherwise directed or indicated.

I. Integrated Exterior Mockups: Construct integrated exterior mockup according to approved Shop Drawings or as indicated on Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials. Comply with requirements in "Mockups" Paragraph in this Section.

J. Room Mockups: Construct room mockups according to approved Shop Drawings or as indicated on Drawings, incorporating required materials and assemblies, finished according to requirements. Provide required lighting and additional lighting where required to enable Commissioner to evaluate quality of the Work. Comply with requirements in "Mockups" Paragraph in this Section.

K. Laboratory Mockups: Comply with the requirements of preconstruction testing and those specified in individual Specification Sections.

1.8 QUALITY CONTROL:

A. City's Responsibilities: Where quality-control services are indicated as the City's responsibility in the Specifications, the City will engage a qualified testing agency to perform these services. (Refer to Special Inspections Article 1.10.)

1. COST OF TESTS BORNE BY THE CITY: Where the City directs tests to be performed to determine compliance with the Specifications regarding materials or equipment, and where such compliance is ascertained as a result thereof, the City will bear the cost of such tests.
2. The City will furnish the Contractor with names, addresses, and telephone numbers of testing entities engaged and a description of the types of testing and inspecting they are engaged to perform.

3. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to the Contractor.

B. Contractor's Responsibility: Tests and inspections not explicitly assigned to the City are the Contractor's responsibility. Unless otherwise indicated, the Contractor must provide quality control services as set forth in the Specifications and those required by authorities having jurisdiction, whether specified or not.

1. COST OF TESTS BORNE BY CONTRACTOR - In the case of tests which are specifically called for in the Specifications to be provided by the Contractor or tests which are required by any authority having jurisdiction, but are not indicated as the responsibility of the City, the cost thereof will be borne by the Contractor and will be deemed to be included in the Contract price. The Contractor must reimburse the City for expenditures incurred in providing tests on materials and equipment submitted by the Contractor as the equivalent of that specifically named in the Specifications and rejected for non-compliance.
2. Where services are indicated as Contractor's responsibility, the Contractor must engage a qualified testing agency to perform these quality-control services. Any testing agency engaged by the Contractor to perform quality control services is subject to prior approval by the Commissioner.
3. The Contractor must not employ same entity engaged by the City, unless agreed to in writing by the Commissioner.
4. The Contractor must notify testing agencies and the Commissioner at least 72 hours in advance of the date and time for the performance of Work that requires testing or inspecting.
5. Where quality control services are indicated as Contractor's responsibility, the Contractor must submit a certified written report of each quality-control service, in triplicate, to the Commissioner.
6. Testing and inspecting requested by the Contractor and not required by the Contract Documents are Contractor's responsibility.
7. The Contractor must submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, the Contractor must engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Results must be submitted in writing as specified in Section 01 33 00 SUBMITTAL PROCEDURES. Manufacturer's field representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

D. Retesting/Re-inspecting: Regardless of whether the original tests or inspections were the Contractor's responsibility, the Contractor must provide quality control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.

E. Testing Agency Responsibilities: Cooperate with Commissioner and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Commissioner and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform duties of Contractor.

F. Associated Services: The Contractor must cooperate with entities performing required tests, inspections, and similar quality control services, and must provide reasonable auxiliary services as requested. The

Contractor must notify the testing agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist testing entity in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing entities.
6. Design mix proposed for use for material mixes that require control by the testing entity.
7. Security and protection for samples and for testing and inspecting equipment at the Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality assurance and quality control services with minimal delay and avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

2. Coordinate and cooperate with the Commissioning Authority/Agent as applicable for start-up, inspection and functional testing in the implementation of the Commissioning Plan.

H. Manufacturer's Directions: Where the Specifications provide that the manufacturer's directions are to be used, such printed directions must be submitted to the Commissioner.

I. Inspection of Material: In the event that the Specifications require the Contractor to engage the services of an entity to witness and inspect any material specially manufactured or prepared for use in or part of the permanent construction, such entity will be subject to prior written approval by the Commissioner.

1. NOTICE - The Contractor must give notice in writing to the Commissioner, sufficiently in advance of its intention to commence the manufacture or preparation of materials specially manufactured or prepared for use in or as part of the permanent construction. Such notice must contain a request for inspection, the date of commencement, and the expected date of completion of the manufacture or preparation of materials. Upon receipt of such notice, the Commissioner will arrange to have a representative present at such times during the manufacture as may be necessary to inspect the materials, or the Commissioner will notify the Contractor that the inspection will be made at a point other than the point of manufacture, or the Commissioner will notify the Contractor that inspection will be waived.

J. No Shipping Before Inspection: The Contractor must comply with the foregoing before shipping any material.

K. Certificate of Manufacture: When the Commissioner so requires, the Contractor must furnish to the Commissioner, authoritative evidence in the form of Certificates of Manufacture that the materials to be used in the Work have been manufactured and tested in conformity with the Specifications. These certificates must include copies of the results of physical tests and chemical analyses where necessary, that have been made directly on the product, or on similar products being fabricated by the manufacturer. This may include such approvals as the Bureau of Standards and Appeals (B.S.A.), the Materials and Equipment (M.E.A.) acceptance Index, the Bureau of Electrical Control (B.E.C.), etc.

L. Acceptance: When materials or manufactured products comprise of such quantity that it is not practical to make physical tests or chemical analyses directly on the product furnished, a certificate stating the results of such tests or analyses of similar materials which were concurrently produced may, at the discretion of the Commissioner, be considered as the basis for the acceptance of such material or manufactured product.

M. Testing Compliance: The testing personnel must make the necessary inspections and tests, and the reports thereof must be in such form as will facilitate checking to determine compliance with the Specifications, indicating thereon all analyses and/or test data and interpreted results thereof.

N. Reports: Reports in duplicate must be submitted and authoritative certification thereof must be furnished to the Commissioner as a prerequisite for the acceptance of any material or equipment.

O. Rejections: If, in making any test, it is ascertained by the Commissioner that the material or equipment does not comply with the Specifications, the Contractor will be notified thereof, and will be directed to refrain from delivering said materials or equipment, or to promptly remove it from the site or from the Work and replace it with acceptable material at no additional cost to the City.

P. Furnish Designated Materials: Upon rejection of any material or equipment submitted as the equivalent of that specifically named in the Specifications, the Contractor must immediately proceed to furnish the designated material or equipment.

1.9 APPROVAL OF MATERIALS:

A. Local Laws: All materials, appliances and types or methods of construction must be in accordance with the Specifications and must in no event be less than that necessary to conform to the requirements of the New York City (NYC) Construction Codes, Administrative Code and Charter of the City of New York.

B. Approval of Manufacturer: The names of proposed manufacturers, material suppliers, and dealers who are to furnish materials, fixtures, equipment, appliances or other fittings must be submitted to the Commissioner for approval, as early as possible, to afford proper review and analysis. No manufacturer will be approved for any materials to be furnished under the Contract unless it has a plant of ample capacity and have successfully produced similar products. All approvals of materials or equipment that are legally required by the NYC Construction Codes and other governing authorities must be obtained prior to installation.

C. All Materials: Fixtures, fittings, supplies and equipment furnished under the Contract must be new and unused, except as approved by the Commissioner, and of standard first-grade quality and of the best workmanship and design. The City of New York encourages the use of recycled products where practical.

D. INFORMATION TO SUPPLIERS - In asking for prices on materials under any item of the Contract, the Contractor must provide the manufacturer or dealer with such complete information from the Specifications and Contract Drawings as may in any case be necessary, and in every case the Contractor must inform the manufacturer or dealer of all the General Conditions and requirements herein contained.

1.10 SPECIAL INSPECTIONS:

A. SPECIAL INSPECTIONS:

1. Inspection of selected materials, equipment, installation, fabrication, erection, or placement of components and connections made during the progress of the Work to ensure compliance with the Contract Documents and provisions of the NYC Construction Codes, will be made by a Special Inspector. The City of New York will retain the services of the Special Inspector and bear the costs for the performance of Special Inspections in compliance with NYC Construction Codes requirements or as additionally may be called for in the project specifications, except as noted below for Form TR-3: Technical Report for Concrete Design Mix. The Special Inspector will be an entity that is in compliance with the requirements of the NYC Construction Codes. The Contractor must notify the relevant Special Inspector in writing at least 72 hours before the commencement of any Work requiring special inspection.

2. Form TR3: Technical Report Concrete Design Mix: The Contractor will be responsible for, and bear all costs associated with the filing and securing of approvals, if any, for Form TR3: Technical Report Concrete Design Mix, including, but not limited to, engaging the services of a New York City licensed Concrete Testing Lab for the review and approval of concrete design mix, testing, signatures and professional seals, etc., compliant with NYC Department of Buildings requirements, for each concrete design mix.

3. The Contractor must notify the relevant Special Inspector in writing at least 72 hours before the commencement of any Work requiring Special Inspection. The Contractor will be responsible for and bear related costs to assure that all construction or work has suitable access and remains exposed for inspection purposes until the required inspection is completed.

4. Inspections and tests performed under "Special Inspection" will not relieve the Contractor of the responsibility to comply with the Contract Documents, and that there is no warranty given to the Contractor by the City of New York in connection with such inspection and tests or certifications made under "Special Inspections".

5. The Contractor must coordinate with the Commissioner to provide access and schedule the Work for inspection by the Special Inspector.

6. Any fabricators or off-site activities that require Special Inspection paid for by the City of New York must be within the continental United States, Canada, or Mexico, unless approved in writing by the Commissioner. If approval is granted, the Contractor will be responsible for the Special Inspector's travel costs.

1.11 INSPECTIONS BY OTHER CITY AGENCIES:

A. Letter of Completion: Just prior to Substantial Completion of the Project, the Commissioner will file with the Department of Buildings, an application for a Letter of Completion or a Certificate of Occupancy for the structure.

B. Final Inspections: In connection with the above-mentioned application for a Letter of Completion or a Certificate of Occupancy and before certificates of final payments are issued, the Contractor will be required to arrange for all final inspections by the inspection staff of the Department of Buildings, Fire Department, or other Governmental Agencies having jurisdiction, and secure all reports, sign offs, certificates, etc., by such inspection staff or other governmental agencies, in order that a Letter of Completion or Certificate of Occupancy can be issued promptly.

1.12 CERTIFICATES OF APPROVAL:

A. Responsibility: The Contractor will be responsible for and must obtain all final approvals for the Work installed under the Contract in the form of such certificates that are required by all governmental agencies having jurisdiction over the Work of the Contract.

B. Transmittal: All such certificates must be forwarded to the DDC.

1.13 ACCEPTANCE TESTS:

A. Government Agencies: All equipment and appliances furnished and installed under the Contract must conform to the requirements of the Specifications and will in no event be less than that necessary to comply with the minimum requirements of the law and all of the governmental agencies having jurisdiction.

B. Notice of Tests: Whenever the Specifications and/or any governmental agency having jurisdiction requires the acceptance test, the Contractor will give to all concerned, written notice of the time when these tests will be conducted.

C. Energy: The City will furnish all energy, fuel, water, and light required for tests.

D. Labor and Materials: The Contractor must furnish labor and all other material and instruments necessary to conduct the acceptance tests at no additional cost to the City.

E. Certificates: The Final Acceptance by the Commissioner will be contingent upon the Contractor delivering to the Commissioner all necessary certificates evidencing compliance in every respect with the requirements of the regulatory agencies having jurisdiction.

F. Results: If the results of tests and Special Inspections indicate that the material or procedures do not meet requirements as set forth on the Contract Drawings or in the Specifications or are otherwise unsatisfactory, the Contractor must only proceed as directed by the Commissioner. Additional costs resulting from retesting, re-inspecting, replacing of material and/or damage to the Work and any delay caused to the schedule will be borne by the Contractor.

PART II - PRODUCTS (Not Used)

PART III - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, the Contractor must repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.

END OF SECTION 01 40 00

SECTION 01 42 00
REFERENCES

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 DEFINITIONS:

REFER TO THE ADDENDUM, Article IX, FOR ADDITIONAL DEFINITIONS AND REVISIONS TO THE CONTRACT AND SPECIFICATIONS

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

B. "APPROVED," ETC. - "Approved," "acceptable," "satisfactory," and words of similar import will mean and intend approved, acceptable, or satisfactory to the Commissioner.

C. Design Consultant: “Design Consultant” means the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the “Design Consultant” may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

D. "DIRECTED," "REQUIRED," ETC.- Wherever reference is made in the Contract to the Work or its performance, the terms "directed," "required," "permitted," "ordered," "designated," "prescribed," "determined," and words of similar import will, unless expressed otherwise, imply the direction, requirements, permission, order, designation or prescription of the Commissioner.

E. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project Site is shown on Drawings.

1.3 CODES, AGENCIES AND REGULATIONS:

A.B.A	Architectural Barriers Act
A.D.A.A.G.	Americans with Disabilities Act (ADA) Accessibility Guidelines
B.G. & E.	Bureau of Gas and Electricity of the City of New York
B.S. A.	New York City Board of Standards and Appeals
DOE	Department of Energy
E.C.C.C.N.Y.S.	Energy Conservation Construction Code of New York State
EPA	Environmental Protection Administration
N.Y.C.C.C.	New York City Construction Codes
N.Y.C.P.C.	New York City Plumbing Code
N.Y.C.B.C.	New York City Building Code
N.Y.C.M.C.	New York City Mechanical Code New York
N.Y.C.F.G.C.	New York City Fuel Gas Code
N.Y.S. D.O.L	New York State Department of Labor
N.Y.C.D.O.B.	New York City Department of Buildings
N.Y.C.D.E.P.	New York City Department of Environmental Protection
N.Y.C.D.O.T.	New York City Department of Transportation
N.Y.C.E.C.	New York City Electrical Code
N.Y.C.E.C.C	New York City Energy Conservation Code
N.Y.C.F.C.	New York City Fire Code
N.Y.S...D.E.C.	New York State Department of Environmental Conservation
O.S.H.A.	Occupational Safety & Health Administration

1.4 INDUSTRY STANDARDS:

A. STANDARD REFERENCES – Unless otherwise specifically indicated in the Contract Documents, whenever reference is made to the furnishing of materials or testing thereof that conforms to the standards of any technical society, organization or body, it must be construed to mean the latest standard, code, specification adopted and published by that technical society, organization or body, as of the date of the bid opening, unless the provisions of the N.Y.C.C.C. adopts a different or earlier dated version of such standard. All references to the ICC A117.1 are only to the 2009 version, whether or not a specific version is specified.

B. APPLICABILITY OF STANDARDS: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect, to the extent referenced, as if bound or copied directly into the Contract Documents. Such standards are made a part of the Contract Documents by reference.

C. CONFLICTING REQUIREMENTS: Where compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantity or quality, comply with the most stringent requirements. Immediately refer uncertainties and requirements that are different but apparently equal, to the Commissioner in writing for a decision before proceeding.

D. STANDARD SPECIFICATIONS - When no reference is made to a code, standard, or specification, the Standard Specifications of the ASTM or the AIEE, as the case may be, shall govern.

E. REFERENCES - Reference to a technical society, organization, or body may be made in the Specifications by abbreviations. Abbreviations and acronyms used in the Specifications and other Contract Documents mean the associated name. The following names are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the Issue Date of the Contract Documents.

AA	Aluminum Association, Inc. (The)
AAADM	American Association of Automatic Door Manufacturers
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AAPFCO	Association of American Plant Food Control Officials
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists (The)
ABAA	Air Barrier Association of America
ABMA	American Bearing Manufacturers Association
ACI	ACI International (American Concrete Institute)
ACAC	American Council for Accredited Certification
ACPA	American Concrete Pipe Association
AEIC	Association of Edison Illuminating Companies, Inc. (The)
AF&PA	American Forest & Paper Association
AGA	American Gas Association
AGC	Associated General Contractors of America (The)
AGMA	American Gear Manufacturer Association
AHA	American Hardboard Association (Now part of CPA)
AHAM	Association of Home Appliance Manufacturers
AI	Asphalt Institute

AIA	American Institute of Architects (The)
AIEE	American Institute of Electrical Engineers
AIHA	American Industrial Hygiene Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALCA	Associated Landscape Contractors of America (Now PLANET - Professional Landcare Network)
ALSC	American Lumber Standard Committee, Incorporated
ALI	Automotive Lift Institute
AMCA	Air Movement and Control Association International, Inc.
ANSI	American National Standards Institute
AOSA	Association of Official Seed Analysts, Inc.
APA	APA - The Engineered Wood Association
APA	Architectural Precast Association
API	American Petroleum Institute
ARI	Air-Conditioning & Refrigeration Institute
ARMA	Asphalt Roofing Manufacturers Association
ASA	American Standards Association
ASAE	American Society of Agricultural Engineers
ASCE/SEI	American Society of Civil Engineers, Structural Engineering Institute
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineering
ASTM	ASTM International (Formerly: American Society for Testing and Materials)

AWCI	Association of the Wall and Ceiling Industry
AWCMA	American Window Covering Manufacturers Association (Now WCSC)
AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWSC	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association (The)
BICSI	Building Industry Consulting Services International
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International)
BISSC	Baking Industry Sanitation Standards Committee
CDPH	California Department of Public Health
CIBSE	Charted Institute of Building Services Engineers
CCC	Carpet Cushion Council
CDA	Copper Development Association
CEA	Consumer Electronics Association
CESB	Council of Engineering and Scientific Specialty Boards
CFFA	Chemical Fabrics & Film Association, Inc.
CFSEI	Cold-Formed Steel Engineers Institute
CGA	Compressed Gas Association
CGSB	Canadian General Standards Board
CIMA	Cellulose Insulation Manufacturers Association
CIPRA	Cast Iron Pipe Research Association

CISCA	Ceilings & Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CPA	Composite Panel Association
CPPA	Corrugated Polyethylene Pipe Association
CPSC	Consumer Product Safety Commission
CRI	Carpet & Rug Institute (The)
CRSI	Concrete Reinforcing Steel Institute
CSA	Canadian Standards Association
CSI	Cast Stone Institute
CSI	Construction Specifications Institute (The)
CSSA	Certified Steel Stud Association
CSSB	Cedar Shake & Shingle Bureau
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute)
DASMA	Door and Access Systems Manufacturer's Association International
DHI	Door and Hardware Institute
DOC	U.S. Department of Commerce – National Institute of Standards and Technology
EIA	Electronic Industries Alliance
DOJ	U.S. department of Justice
EIMA	EIFS Industry Members Association
DOL	U.S. Department of labor

EJCDC	Engineers Joint Contract Documents Committee
DOTn	U.S. Department of Transportation
EN	European Committee of Standards
EJMA	Expansion Joint Manufacturers Association, Inc.
ESD	ESD Association
EVO	Efficiency Valuation Organization
FEMA	Federal Emergency Management Agency
FGIA	Fenestration and Glazing Industry Alliance
FIBA	Federation Internationale de Basketball Amateur (The International Basketball Federation)
FIVB	Federation Internationale de Volleyball (The International Volleyball Federation)
FMG	FM Global (Formerly: FM - Factory Mutual System)
FMRC	Factory Mutual Research (Now FMG)
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.
FSA	Fluid Sealing Association
FSC	Forest Stewardship Council
GA	Gypsum Association
GANA	Glass Association of North America
GRI	(Now GSI)
GS	Green Seal
GSI	Geosynthetic Institute
HI	Hydraulic Institute
HI	Hydronics Institute
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)

HPVA	Hardwood Plywood & Veneer Association
HPW	H. P. White Laboratory, Inc.
HUD	U.S. Department of Housing and Urban Development
IAPMO	International Association of Plumbing and Mechanical Officials
IAS	International Approval Services (Now CSA International)
IBF	International Badminton Federation
ICC	International Code Council, Inc.
ICEA	Insulated Cable Engineers Association, Inc.
ICRI	International Concrete Repair Institute, Inc.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The)
IESNA	Illuminating Engineering Society of North America
IEST	Institute of Environmental Sciences and Technology
IGCC	Insulating Glass Certification Council
IGMA	Insulating Glass Manufacturers Alliance
IICRC	Institute of Inspection, Cleaning, and Restoration
ILIA	Indiana Limestone Institute of America, Inc.
IPEMA	International Play Equipment Manufacturers Association
ISA	International Society of Arboriculture
ISO	International Organization for Standardization
ISSFA	International Solid Surface Fabricators Association
ITS	Intertek

ITU	International Telecommunication Union
KCMA	Kitchen Cabinet Manufacturers Association
LMA	Laminating Materials Association (Now part of CPA)
LPI	Lightning Protection Institute
MBMA	Metal Building Manufacturers Association
MFMA	Maple Flooring Manufacturers Association, Inc.
MFMA	Metal Framing Manufacturers Association
MH	Material Handling (Now MHIA)
MHIA	Material Handling Industry of America
MIA	Marble Institute of America
MIL	Military Specification Standards of the US Dept of Defense
MPEG	Moving Picture Experts Group
MPI	Master Painters Institute
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc.
NAAMM	National Association of Architectural Metal Manufacturers
NACE	NACE International (National Association of Corrosion Engineers International)
NADCA	National Air Duct Cleaners Association
NAGWS	National Association for Girls and Women in Sport
NAIMA	North American Insulation Manufacturers Association
NBA	National Basketball Association
NBGQA	National Building Granite Quarries Association, Inc.
NCAA	National Collegiate Athletic Association (The)
NCMA	National Concrete Masonry Association
NCPI	National Clay Pipe Institute

NCTA	National Cable & Telecommunications Association
NEBB	National Environmental Balancing Bureau
NECA	National Electrical Contractors Association
NeLMA	Northeastern Lumber Manufacturers' Association
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
NETA	InterNational Electrical Testing Association
NFHS	National Federation of State High School Associations
NFPA	NFPA (National Fire Protection Association)
NFRC	National Fenestration Rating Council
NGA	National Glass Association
NHLA	National Hardwood Lumber Association
NICET	National Institute for Certification in Engineering Technologies
NLGA	National Lumber Grades Authority
NIS	National Institute of Standards and Technology
NOFMA	NOFMA: The Wood Flooring Manufacturers Association (Formerly: National Oak Flooring Manufacturers Association)
NRCA	National Roofing Contractors Association
NRDCA	National Roof Deck Association
NRMCA	National Ready Mixed Concrete Association
NSI	Natural Stone Institute
NSF	NSF International (National Sanitation Foundation International)
NSSGA	National Stone, Sand & Gravel Association
NTMA	National Terrazzo & Mosaic Association, Inc. (The)

NTRMA	National Tile Roofing Manufacturers Association (Now TRI)
NWWDA	National Wood Window and Door Association (Now WDMA)
OPL	Omega Point Laboratories, Inc. (Acquired by ITS - Intertek)
PCI	Precast / Pre-stressed Concrete Institute
PDCA	Painting & Decorating Contractors of America
PDI	Plumbing & Drainage Institute
PGI	PVC Geomembrane Institute
PLANET	Professional Landcare Network (Formerly: ACLA - Associated Landscape Contractors of America)
PPS	Power Piping Society
PTI	Post-Tensioning Institute
RCSC	Research Council on Structural Connections
RFCI	Resilient Floor Covering Institute
RIS	Redwood Inspection Service
RMI	Rack Manufacturers Institute
RTI	(Formerly: NTRMA - National Tile Roofing Manufacturers Association) (Now TRI)
RUS	Rural Utilities Service, Department of Agriculture
SAE	SAE International
SCAQMD	South Coast Air Quality Management District
SCS	Scientific Certification System
SDI	Steel Deck Institute
SDI	Steel Door Institute
SEFA	Scientific Equipment and Furniture Association
SGCC	Safety Glazing Certification Council

SHBI	Steel Heating Boiler Institute
SIA	Security Industry Association
SIGMA	Sealed Insulating Glass Manufacturers Association (Now IGMA)
SFIA	Steel Framing Industry Association
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SMPTE	Society of Motion Picture and Television Engineers
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division)
SPIB	Southern Pine Inspection Bureau (The)
SPRI	Single Ply Roofing Industry
SSINA	Specialty Steel Industry of North America
SSMA	the Steel Stud Manufacturers Association
SSPC	SSPC: The Society for Protective Coatings
SSSA	Soil Science Society of America
STI	Steel Tank Institute
SWI	Steel Window Institute
SWRI	Sealant, Waterproofing, & Restoration Institute
TABB	Testing, Adjusting, and Balancing Bureau
TCA	Tile Council of America, Inc.
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance
TMS	The Masonry Society

TPI	Truss Plate Institute, Inc.
TPI	Turfgrass Producers International
TRI	Tile Roofing Institute (Formerly: RTI - Roof Tile Institute)
UL	Underwriters Laboratories Inc.
ULC	Underwriters Laboratories of Canada
UNI	Uni-Bell PVC Pipe Association
USAV	USA Volleyball
USC	United States Code
USGBC	U.S. Green Building Council
USITT	United States Institute for Theatre Technology, Inc.
WASTEC	Waste Equipment Technology Association
WCLIB	West Coast Lumber Inspection Bureau
WCMA	Window Covering Manufacturers Association (Now WCSC)
WCSC	Window Covering Safety Council (Formerly: WCMA - Window Covering Manufacturers Association)
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association)
WNBA	Women's National Basketball Association
WI	Woodwork Institute (Formerly: WIC - Woodwork Institute of California)
WIC	Woodwork Institute of California (Now WI)
WMMPA	Wood Moulding & Millwork Producers Association
WRI	Wire Reinforcement Institute, Inc.
USEPA	United States Environmental Protection Agency
WSRCA	Western States Roofing Contractors Association

WWPA Western Wood Products Association

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 42 00

SECTION 01 50 00
TEMPORARY FACILITIES, SERVICES AND CONTROLS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes the following:
1. Temporary Water System
2. Temporary Sanitary Facilities
3. Temporary Electric Power, Temporary Lighting System, and Site Security Lighting
4. Temporary Heat
5. Dewatering Facilities and Drains
6. Temporary Field Office for Contractor
7. DDC Field Office
8. Material Sheds
9. Temporary Enclosures
10. Temporary Partitions
11. Temporary Fire Protection
12. Work Fence Enclosure
13. Rodent and Insect Control
14. Plant Pest Control Requirements
15. Project Identification Signage
16. Project Construction Sign and Rendering
17. Security Guards/Fire Guards on Site
18. Safety

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY

B. Section 01 42 00 REFERENCES

C. Section 01 54 11 TEMPORARY ELEVATORS AND HOISTS

D. Section 01 54 23 TEMPORARY SCAFFOLDS AND SWING STAGING

E. Section 01 77 00 CLOSE OUT PROCEDURES

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Term	Definition
Design Consultant	The entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the Design Consultant may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.
Permanent Enclosure	As determined by the Commissioner, permanent or temporary roofing that is complete, insulated, and weather tight; exterior walls which are insulated and weather tight; and all openings that are closed with permanent construction or substantial temporary closures.

1.5 SUBMITTALS:

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

B. Reports: Submit reports of tests, inspections, meter readings and similar procedures for temporary use.

1.6 PROJECT CONDITIONS:

A. Temporary Use of Permanent Facilities and Services: The Contractor will be responsible for the operation, maintenance, and protection of each permanent facility and service during its use as a construction facility before Final Acceptance by the City, regardless of previously assigned responsibilities.

B. The Contractor must install, operate, maintain and protect temporary facilities, services, and controls, including without limitation:

1. Keep temporary services and facilities clean and neat in appearance;
2. Operate temporary services in a safe and efficient manner;
3. Relocate temporary services and facilities as needed as Work progresses;
4. Do not overload temporary services and facilities or permit them to interfere with progress;
5. Provide necessary fire prevention measures; and
6. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on-Site.

1.7 NON-REGULAR WORK HOURS (OVERTIME):

A. The Contractor must provide the temporary services, facilities and controls set forth in this section during non-regular working hours if the Contract Drawings and/or the Specifications indicate that the Work, or specific components thereof, must be performed during non-regular working hours. In such case, all costs for the provision of temporary services, facilities and controls during non-regular working hours will be deemed included in the total Contract price.

B. The Contractor must provide the temporary services, facilities and controls set forth in this section during non-regular working hours if a change order is issued directing the Contractor to perform the Work, or specific components thereof, during non-regular working hours. In such case, compensation for the provision of temporary services, facilities and controls during non-regular working hours will be provided

through the change order.

1.8 SERVICES BEYOND COMPLETION DATE:

A. The Contractor must provide the temporary services, facilities and controls set forth in this section until the date on which it completes all required Work at the Site, including all Final Approved Punch List Work, as certified in writing by the Resident Engineer, or earlier if so directed in writing by the Commissioner. The Contractor must provide such temporary services, facilities and controls even if completion of all required Work at the Site occurs after the time fixed for such completion in Schedule A.

PART II – PRODUCTS

2.1 MATERIALS:

A. The Contractor must provide undamaged materials in serviceable condition and suitable for use intended.

B. Tarpaulins: Waterproof, fire-resistant UL labeled with flame spread rating of fifteen (15) or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.

C. Water: Potable and in compliance with requirements of the New York City Department of Environmental Protection (DEP).

2.2 EQUIPMENT:

A. The Contractor must provide undamaged equipment in serviceable condition and suitable for use intended.

B. Water Hoses: Heavy-duty abrasive-resistant flexible rubber hoses, one hundred (100) feet (thirty (30) m) long with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

C. Electric Power Cords: Grounded extension cords.

1. Provide hard-service cords where exposed to abrasion or traffic.

2. Provide waterproof connectors to connect separate lengths of electric cords where single lengths do not reach areas of construction Activity.

3. Do not exceed safe length-voltage ratio.

D. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART III –EXECUTION:

3.1 INSTALLATION, GENERAL:

A. The Contractor must locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. The Contractor must provide each facility ready for use when needed to avoid delay. The Contractor must not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities as approved by the Resident Engineer.

3.2 TEMPORARY WATER SYSTEM:

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.2 A

A. TEMPORARY WATER SYSTEM - NEW FACILITIES: During construction, the Contractor must furnish a Temporary Water System as set forth below.

1. Immediately after the Commissioner has issued an order to start the Work, the Contractor must file an application with DEP for the schedule of charges for water use during construction. The Contractor will be responsible for payment of water charges.

2. Immediately after the Commissioner has issued an order to start the Work, the Contractor must file an application with DEP's Bureau of Water Supply and obtain a permit to install the temporary water supply system. The system must be installed and maintained for the use of the Contractor and its Subcontractors. A copy of the above-mentioned permit must be filed with the Commissioner. The Contractor must provide temporary water main, risers and waste stacks as directed and install on each floor, outlets with two (2) 3/4" hose valve connections over a barrel installed on a steel pan. The Contractor must provide drains from the pans to the stack and house sewer and hose bibs to drain the water supply risers and mains. During winter months, the Contractor must take the necessary precautions to prevent the temporary water system from freezing. The Contractor must provide repairs to the temporary water supply system for the duration of the Project until said temporary system is dismantled and removed.

3. Disposition of Temporary Water System: The Contractor will be responsible for dismantling the temporary water system when no longer required for the construction operations, or when replaced by the permanent water system installed for the Project, or as otherwise directed by the Resident Engineer. All repair work resulting from the dismantling of the temporary water system will be the responsibility of the Contractor.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.2 B

B. TEMPORARY WATER SYSTEM – PROJECTS IN EXISTING FACILITIES:

1. When approved by the Commissioner, use of existing water system will be permitted for temporary water service during construction, as long as the system is cleaned and maintained in a condition acceptable to the Commissioner. At Substantial Completion, the Contractor must restore the existing water system to conditions existing before initial use.

2. The Contractor will be responsible for all repairs to the existing water system permitted to be used for temporary water service during construction. The Contractor will be responsible to maintain the existing system in a clean condition on a daily basis, acceptable to the Commissioner.

3. The Contractor will be responsible for payment of water charges as directed by the Commissioner. Billing will be in accordance with the New York City Water Board Water and Wastewater Rate Schedule.

C. WASH FACILITIES: The Contractor must install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition, including without limitation:

1. Dispose of drainage properly.

2. Supply cleaning compounds appropriate for each condition; and

3. Include safety showers, eyewash fountains and similar facilities for the convenience, safety and sanitation of personnel.

D. DRINKING WATER FACILITIES: The Contractor must provide drinking water fountains or containerized tap-dispenser bottled-drinking water units, complete with paper cup supplies. Where power is available, provide

electric water coolers to maintain dispensed water temperature at forty-five (45) to fifty-five (55) deg. F (7 to 13 deg. C).

3.3 TEMPORARY SANITARY FACILITIES:

A. The Contractor must provide toilets, wash facilities, and drinking water fixtures in compliance with regulations and health codes for type, number, location, operation and maintenance of fixtures and facilities. Provide toilet tissue, paper towels, paper cups and similar disposable materials as appropriate for each facility, and provide covered waste containers for used materials.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3 B

B. SELF-CONTAINED TOILET UNITS:

1. The Contractor must provide temporary single-occupant toilet units of the chemical, aerated re-circulation, or combustion type for use by all construction personnel. Units must be properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material. Quantity of toilet units must comply with the latest Occupational Safety and Health Administration (OSHA) regulations.

2. Toilets: The Contractor must install separate, self-contained toilet units for male and female personnel. Shield toilets to ensure privacy.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3 C

C. EXISTING TOILETS:

1. TOILET FACILITIES: When approved by the Commissioner, the Contractor must arrange for the use of existing toilet facilities by all personnel during the execution of the Work. The Contractor will be responsible to clean and maintain facilities in a condition acceptable to the Resident Engineer and, at Substantial Completion, to restore facilities to the condition at the time of initial use.

2. MAINTENANCE - The Contractor must maintain the temporary toilet facilities in a clean and sanitary manner and make all necessary repairs.

3. NUISANCES - The Contractor must not cause any sanitary nuisance to be committed by its employees or the employees of its Subcontractors in or about the Work and must enforce all sanitary regulations of the City and State Health Authorities.

3.4 TEMPORARY ELECTRIC POWER, TEMPORARY LIGHTING SYSTEM, AND SITE SECURITY LIGHTING:

A. SCOPE: This section sets forth the General Conditions and procedures relating to Temporary Electric Power, Temporary Lighting System, and Site Security Lighting during the construction period.

B. TEMPORARY ELECTRIC POWER: The Contractor must provide and maintain a temporary electric power service and distribution system of sufficient size, capacity and power characteristics required for construction operations for all required Work by the Contractor and its Subcontractors, including but not limited to, power for the temporary lighting system, site security lighting, construction equipment, hoists, temporary elevators and all field offices. temporary electric power must be provided as follows:

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 B (1)

1. CONNECTION TO UTILITY LINES:

a. Temporary electric power service for use during construction must be provided as follows: The Contractor must make all necessary arrangements with the public utility company and pay all charges for the Temporary Electric Power system. The Contractor must include in its total Contract price any charges for temporary electric power, including charges that may be made

by the public utility company for extending its electrical facilities, and for making final connections. The Contractor will make payment directly to the public utility company.

b. APPLICATIONS FOR METER: The Contractor must complete an application to the public utility company and sign all documents necessary for, and pay all charges incidental to, the installation of a watt hour meter or meters for Temporary Electric Power. The Contractor must pay to the public utility company all bills for temporary electric energy used throughout the Work as they become due.

c. SERVICE AND METERING EQUIPMENT: The Contractor must furnish and install, at a suitable location on the Site, approved service and metering equipment for the Temporary Electric Power System, ready for the installation of the public utility company's metering devices. The temporary service mains to and from the metering location must not be less than one hundred (100) Amperes, 3-phase, 4-wire and must be of sufficient capacity to take care of all demands for all construction operations and must meet all requirements of the New York City Electrical Code.

d. PAYMENT: See Sub-Section 3.4.F regarding payment for this scope of work.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 B (2)

2. CONNECTION TO EXISTING ELECTRICAL POWER SERVICE:

a. When approved by the Commissioner, electrical power service for the temporary lighting system and for the operation of small tools and equipment less than ¼ horsepower may be taken from the existing electric distribution system if the existing system is of adequate capacity for the temporary power load. The Contractor must cooperate and coordinate with the facility custodian, so as not to interfere with the normal operation of the facility.

b. There will be no charge to the Contractor for the electrical energy consumed.

c. The Contractor must provide, maintain and pay all costs for separate temporary electric power for any temporary power for equipment larger than 1/4 horsepower. When directed by the Commissioner, the Contractor must remove its own temporary power system.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 B (3)

3. ELECTRICAL GENERATOR POWER SERVICE:

a. When connection to utility lines or existing facility electric service is not available or is not adequate to supply the electric power need for construction operations, the Contractor must provide self-contained generators to provide power beyond that available.

b. Pay for all energy consumed in the progress of the Work, exclusive of that available from the existing facility or utility company.

c. Provide for control of noise from the generators.

d. Comply with the Ultra Low Sulfur Fuel in Non-Road Vehicles requirements as set forth in Article 5.4 of the Contract.

e. PAYMENT: See Sub-Section 3.4.F regarding payment for this scope of work.

C. USE OF COMPLETED PORTIONS OF THE ELECTRICAL WORK:

1. USE OF MAIN DISTRIBUTION PANEL: As soon as the permanent electric service feeders and equipment metering equipment and main distribution panel are installed and ready for operation, the Contractor must have the temporary lighting and power system changed over from the temporary service points to the main distribution panel.

2. COST OF CHANGE OVER: The Contractor will be responsible for all costs due to this change over of service and it must also make application to the public utility company for a watt hour meter to be set on the permanent meter equipment.

3. The requirements for temporary electric power service specified herein must be adhered to after change over of service until Final Acceptance of the Project.

4. NO EXTRA COST: The operation of the service and switchboard equipment will be under the supervision of the Contractor, but this will in no way be interpreted to mean the acceptance of such part of the installation or relieve the Contractor from its responsibility for the complete Work or any part thereof. There will be no additional charge for supervision by the Contractor.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 D

D. TEMPORARY LIGHTING SYSTEM:

1. The Contractor must provide adequate service for the temporary lighting system, or a minimum of one hundred (100) Amperes, 3-phase, 4-wire service for the temporary lighting system, whichever is greater, and make all necessary arrangements with the public utility company and pay all charges by them for the Temporary Lighting System.

2. The Contractor must furnish and connect to the metered service point a Temporary Lighting System to illuminate the entire area where Work is being performed and points adjacent to the Work, with separately fused circuits for stairways and bridges. Control switches for stairway circuits must be located near entrance on ground floor.

3. ITEMS: The Temporary Lighting System provided by the Contractor must consist of wiring, fixtures, left-hand double sockets (one (1) double socket for every 400 square feet, with one (1) lamp and one (1) three-prong outlet), lamps, fuses, locked-type guards, pigtails and any other incidental material. Additional details may be outlined in the detailed Specifications for the electrical Work. Changes may be made, provided the full equivalent of those requirements is maintained.

4. The Temporary Lighting System will be progressively installed as required for the advancement of the Work under the Contract.

5. RELOCATION: The cost for the relocation or extension of the original Temporary Lighting System, as required by the Contractor or its Subcontractors, that is not required due to the normal advancement of the Work, as determined by the Resident Engineer, will be borne by the Contractor.

6. PIGTAILS: The Contractor must furnish pigtails with left-hand sockets with locked-type guards and forty (40) feet of rubber covered cable. The Contractor must furnish and distribute a minimum of three (3) complete pigtails to each Subcontractor. See the detailed Electrical Specifications for possible additional pigtails required.

7. LAMPS: The Contractor must furnish and install one (1) complete set of lamps, including those for the trailers. Broken and burned out lamps in the temporary lighting system, DDC field office, and construction trailers must be replaced by the Contractor. All lamps must be compact fluorescent.

8. CIRCUIT PROTECTION: The Contractor must furnish and install Ground Fault Interruption (GFI) protection for the temporary lighting and site security lighting systems.

9. MAINTENANCE OF TEMPORARY LIGHTING SYSTEM:

   a. The Contractor must maintain the Temporary Lighting System in good working order during the scheduled hours established.

   b. The Contractor must include in its total Contract price all costs in connection with the Temporary Lighting System, including all costs for installation, maintenance and electric power.

10. REMOVAL OF TEMPORARY LIGHTING SYSTEM: The temporary lighting system must be removed by the Contractor when authorized by the Commissioner.

11. HAND TOOLS: The temporary lighting system must not be used for power purposes, except that light hand tools not larger than 1/4 horsepower may be operated from such system by the Contractor and its Subcontractors.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4 E

E. SITE SECURITY LIGHTING (NEW CONSTRUCTION ONLY):

1. The Contractor must furnish, install and maintain a system of site security lighting, as herein specified, to illuminate the construction Site of the Project, with the system connected to and energized from the Temporary Lighting System. All costs in connection with site security lighting will be deemed included in the total Contract price.

2. It is essential that the site security lighting system be completely installed and operating at the earliest possible date. The Contractor must direct its Subcontractors to cooperate, coordinate and exert every effort to accomplish an early complete installation of the site security lighting system. If, after the system is installed and in operation, a part of the system interferes with the Work of any trade, the Contractor will be completely responsible for the expense of removing, relocating, and replacing all equipment necessary to reinstate the system to proper operating conditions.

3. The system must consist of flood lighting by pole-mounted guarded sealed-beam units. Floodlight units must be mounted sixteen (16) feet above grade. Floodlights must be spaced around the perimeter of the Site to produce an illumination level of no less than one (1) foot candle around the perimeter of the Site, as well as in any potentially hazardous area or any other area within the Site that might be deemed by the Resident Engineer to require security illumination. The system must be installed in a manner acceptable to the Resident Engineer. The first lighting unit in each circuit must be provided with a photoelectric cell for automatic control. The photoelectric cell must be installed as per manufacturer's recommendations.

4. All necessary poles must be furnished and installed by the Contractor.

5. The site security lighting must be kept illuminated at all times during the hours of darkness. The Contractor must, at its own expense, keep the system in operation and must furnish and install all material necessary to replace all damaged or burned out parts.

6. The Contractor must be on telephone call alert for maintaining the system during the operating period stated above.

7. All materials and equipment furnished under this section will remain the property of the Contractor and must be removed and disposed of by the Contractor when authorized in writing by the Resident Engineer.

F. PAYMENT FOR TEMPORARY ELECTRICAL

1. The following temporary Electrical scope will be paid for on unit price basis:

   a. Temporary Electric power where the Contractor pays for the utility costs (subsection 3.4.B.1)

   b. Temporary Electric power where the Contractor provides generator service (subsection 3.4.B.3)

2. All temporary electrical scope described in Subsection 3.4 except as noted above in 3.4.F.1 must be included in the Contractor’s lump sum price.

3. For the temporary electric power that will be paid for by unit price:

a. The quantity to be measured for payment under this item will be the number of months (to the nearest 1/4 month increment) that the Contractor satisfactorily provides for temporary electric power in accordance with these General Conditions.

b. The unit price bid per month for temporary electric power must include the cost of furnishing all labor, materials, plant, equipment, insurance, and incidentals required to provide temporary electric power, all in accordance with the Contract Drawings, these specifications, and the directions of the Commissioner.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.5

3.5 TEMPORARY HEAT:

A. GENERAL:

1. Definition: The provision of Temporary Heat means the provision of heat in order to permit construction to be performed in accordance with the Progress Schedule during all seasons of the year and to protect the Work from the harmful effects of low temperature. In the event the building, or any portion thereof, is occupied during construction, the provision of Temporary Heat will include the provision of heat to permit normal operations in such occupied areas.

   a. The provision of Temporary Heat must be in accordance with the temperature requirements set forth in sub-section 3.5 C herein.

   b. The provision of Temporary Heat must include the provision of: 1) all fuel necessary and required, 2) all equipment necessary and required, and 3) all operating labor necessary and required. Operating labor must mean that minimum force required for the safe day-to-day operation of the system for the provision of Temporary Heat and must include, without limitation, heating maintenance labor and/or fire watch as required by New York City Fire Department (FDNY) regulations. Operating labor may be required seven (7) days per week and during non-regular working hours, for the period of time required by seasonal weather conditions.

   c. In the event the building, or any portion thereof, is occupied and the Project involves the replacement, modification, and/or shut down of the permanent heating system, or any key component thereof, and such system is a combined system which furnishes domestic hot water for the building occupants, the provision of Temporary Heat must include the provision of domestic hot water at the same temperature as the system which is being replaced. Domestic hot water must be provided in accordance with the phasing requirements set forth in the Contract Documents.

2. Responsibility: The Contractor's responsibility for the provision of Temporary Heat, including all expenses in connection therewith, is as set forth below:

   a. Projects involving enclosure of the building:

      i. Prior to Enclosure: Until the Commissioner determines that the building has been enclosed, as set forth in sub-section 3.5 B, the Contractor is responsible for the provision of Temporary Heat.

      ii. Post Enclosure: Once the Commissioner determines that the building, or any portion thereof, has been enclosed, as set forth in sub-section 3.5 B, the Contractor is responsible for the provision of Temporary Heat by one or more of the following means: 1) by an existing heating system (if any), 2) by a permanent heating system which is being installed as part of the Project, or 3) by a temporary heating system(s).

      iii. The Contractor must, within two (2) weeks of the kick-off meeting, submit to DDC for review its proposed plan to provide Temporary Heat. Such plan is subject to approval

by the Resident Engineer. The Contractor must provide Temporary Heat in accordance with the approved plan until written acceptance by the Commissioner of the Work of all Subcontractors, including punch list Work, unless directed otherwise in writing by the Commissioner. The responsibility of the Contractor provided for herein is subject to the exception set forth in sub-section 3.5 A.2 (b) herein.

b. Projects not involving enclosure of the building:

i. If the Project involves the installation of a new permanent heating system if one did not exist previously, or the replacement, modification, and/or shut down of the existing permanent heating system, or any key component thereof, the Contractor will be responsible for the provision of Temporary Heat, except as otherwise provided in sub-section 3.5 H.3(b).2 herein.

ii. If the Project does not involve the installation of a new permanent heating system if one did not exist previously, or the replacement, modification, and/or shut down of the existing permanent heating system, or any key component thereof, there is no Contractor responsibility of the provision of Temporary Heat, unless otherwise specified in the Contract Documents. However, if the Commissioner, pursuant to sub-section 3.5 H.3 (b).1 herein, determines that the provision of Temporary Heat is necessary due to special and/or unforeseen circumstances, the Contractor will be responsible for the provision of Temporary Heat and must be paid for the same in accordance with sub-section 3.5 H.3 (b).1 herein.

B. ENCLOSURE OF STRUCTURES:

1. Notification: The Contractor must notify all of its Subcontractors and the Resident Engineer at least thirty (30) Days prior to the anticipated date that the building(s) will be enclosed.

2. Commissioner Determination: The Commissioner will determine whether the building, or any portion thereof, has been enclosed. As indicated in sub-section 3.5 A.2 above, once the building has been enclosed, the Contractor will be responsible for the provision of Temporary Heat. The Commissioner's determination with respect to building enclosure will be based upon all relevant facts and circumstances, including without limitation, 1) whether the building meets the criteria set forth in Paragraph 3 below, and 2) whether the openings in the building, such as doorways and windows, have been sufficiently covered so as to provide reasonable heat retention and protection from the elements.

3. Criteria for enclosure:

a. Roof Area:

i. A building will be considered to be roofed when the area to be roofed is covered by a permanent structure and all openings through the permanent structure are covered and protected by temporary covers as described in Paragraph (c) below.

ii. Intermediate floor structures of multi-floor buildings will be considered to be roofed subject to the same requirements of the building roof.

iii. The final roofing system need not be in place for the building or structure to be determined to be enclosed, provided, however, all openings through the permanent structure covering the roof must be covered and protected by temporary covers, as described in Paragraph (c) below.

b. Walls: For the walls to be determined to be enclosed, permanent exterior wall elements or facing material must be in place and all openings must be covered and protected by temporary covers, as described in Paragraph (c) below.

c. Temporary Covers: In order to be acceptable, temporary covers must be securely fixed to prevent the entrance of rain, snow and direct wind. The minimum material requirements for temporary covers are as follows: 1) minimum ten (10) millimeter plastic, 2) minimum twelve (12) ounce waterproof canvas tarpaulins, or 3) a minimum three-eighths (3/8) inch thickness exterior grade plywood.

d. Temporary covers for openings will be the responsibility of the Contractor and such Work will be deemed included in the Contract price.

C. TEMPERATURE REQUIREMENTS:

1. Unoccupied Buildings: The temperature requirement for the provision of Temporary Heat in unoccupied buildings will be the GREATER of the following: 1) fifty (50) degrees Fahrenheit, or 2) the temperature requirement for the particular type of Work set forth in the Contract Documents.

2. Occupied Buildings: The temperature requirement for the provision of Temporary Heat in occupied buildings, or portions thereof, will be the GREATER of the following: 1) sixty-eight (68) degrees Fahrenheit, or 2) the temperature requirement for the particular type of Work set forth in the Contract Documents.

D. DURATION:

1. The Contractor is required to provide Temporary Heat until Final Acceptance, including all punch list work, as certified in writing by the Resident Engineer, or earlier if so directed in writing by the Commissioner. The Contractor is responsible for the provision of Temporary Heat for the time specified herein, regardless of any delays in completion of the Project, including delays that result in the commencement of the provision of Temporary Heat during a season that is later than that which may have been originally anticipated. Payment for temporary heat will be made on a unit price basis in accordance with Sub-Section 3.5.K.

E. METHOD OF TEMPORARY HEAT:

1. The method of temporary heat must be in conformance with the New York City Fire Code and with all applicable laws, rules, and regulations. Prior to implementation, such method must be subject to the written approval of the Commissioner.

2. The method of temporary heat must:

a. Not cause the deposition of dirt or smudges upon any finished Work or cause any defacement or discoloration to the finished Work.

b. Not be injurious or harmful to people or materials.

c. Portable fueled heating devises or equipment will NOT be allowed for use as temporary heat other than construction-related curing or drying in conformance with the NYC Fire Code.

3. No open fires will be permitted.

F. TEMPORARY HEATING SYSTEM:

1. The temporary system for the provision of Temporary Heat provided by the Contractor following enclosure of the building must be complete, including, subject to provisions of paragraph E above, boilers pumps, radiators, space heaters, water and heating piping, insulation and controls. The temporary system for the provision of Temporary Heat must be capable of maintaining the minimum temperature requirements set forth in Paragraph C above.

G. COORDINATION:

1. The Contractor, in the provision of Temporary Heat, must coordinate its operations in order to insure sufficient and timely performance of all required Work, including Work performed by trade Subcontractors. The Contractor must supply and pay for all water required and used in the building

for the operation of the heating system(s) for the purpose of Temporary Heat. The Contractor must include all expenses in connection with the supply of water for Temporary Heat in its total Contract price. During the period in which Temporary Heat in an enclosed building is being furnished and maintained, the Contractor must provide proper ventilating and drying, open and close the windows and other openings when necessary for the proper execution of the Work and when directed by DDC. The Contractor must maintain all permanent or temporary enclosures at its own expense.

H. USE OF PERMANENT HEATING SYSTEMS:

1. Use of Permanent Heating System for Temporary Heat after Building Enclosure:

a. The Contractor must provide all labor and materials to promptly furnish and set all required equipment, convectors and/or radiators, piping, valves, fitting, etc., in ample time for their use for the provision of Temporary Heat after enclosure of the building.

b. New portions of the permanent heating system that are used for furnishing Temporary Heat must be left in near-perfect condition when delivered to the City for operation. Any repairs required, other than for ordinary wear and tear on the equipment, must be made by the Contractor at his/her expense. The starting date for the warranty or guarantee period for such equipment must be the date of Substantial Completion acceptance.

c. In the event that the Contractor does not advance the installation of the permanent heating system in sufficient time to permit its use for Temporary Heat as determined by DDC, the Contractor must furnish and install a separate system for the provision of Temporary Heat as required to maintain the minimum temperature requirements set forth in Paragraph C above.

2. All equipment for the system for the provision of Temporary Heat must be placed so as to comply with the requirements specified hereinbefore, and must be connected, disconnected and suitably supported and located so as to permit construction Work, including finish Work such as wall plastering and painting, to proceed. The installation of the system for the provision of Temporary Heat by the Contractor, including the placing of ancillary system equipment, must be coordinated with the operations of all trade Subcontractors so as to insure sufficient and timely performance of the Work. Once the permanent heating system is operating properly, the Contractor must remove all portions of the system for Temporary Heat not part of the permanent heating system.

I. RELATED ELECTRICAL WORK:

1. The Contractor must be responsible for providing the items set forth below and must include all expenses in connection with such items in its total Contract price. The Contractor must provide such items promptly when required and must in all respects coordinate its Work with the Work performed by trade Subcontractors in order to facilitate the provision of Temporary Heat.

a. The Contractor must provide all labor, materials, equipment and power necessary and required to furnish and maintain any temporary or permanent electrical connections to all equipment specified to be connected as part of the work of the Contractor's Contract.

b. The Contractor must supply and pay for all power necessary and required for the operation of the system for the provision of Temporary Heat and/or the permanent heating system used for Temporary Heat. Such power must be provided by the Contractor for the duration the Contractor is required to provide Temporary Heat, as set forth in sub-section 3.5 D herein.

2. In providing the items set forth in Paragraph 1 above, the Contractor is advised that labor may be required seven (7) days a week and/or during non-regular working hours for the period of time required by seasonal weather conditions.

J. RELATED PLUMBING WORK:

1. The Contractor must be responsible for providing all labor, materials, and equipment necessary and required to furnish and maintain all temporary or permanent connections to all equipment or plumbing

outlets specified to be provided as part of the Work of this Contract. The Contractor must include all expenses in connection with such items of Work in its total Contract price. The Contractor must provide such items of Work promptly when required and must in all respects coordinate its Work with the Work performed by trade Subcontractors in order to facilitate the provision of Temporary Heat.

2. In the event portions of the permanent plumbing equipment furnished by the Contractor as part of the Work of this Contract are used for the provision of Temporary Heat either during construction or prior to acceptance by the City of the complete plumbing system, the Contractor will be responsible to provide such plumbing equipment to the City in near-perfect condition and must make any repairs required, other than for ordinary wear and tear on the equipment, at the Contractor's expense. The starting date for warranty and/or guarantee period for such plumbing equipment must be the date of Substantial Completion by the City.

3. For Projects requiring the installation of new and/or modified gas service, as well as associated meter installations, the Contractor must promptly perform all required filings and coordination with the utility companies in order to expedite the installation, testing, and approval of the gas service and associated meter(s).

K. PAYMENT FOR TEMPORARY HEAT

1. Payment for temporary heat will be made on a unit price basis.

2. The quantity to be measured for payment under this item will be the number of months (to the nearest 1/4 month increment) that the Contractor satisfactorily provides for temporary heat in accordance with these specifications.

3. The unit price bid per month for temporary heat must include the cost of furnishing all labor, materials, plant, equipment, insurance, and incidentals required to provide temporary heat, all in accordance with the Contract Drawings, these specifications, and the directions of the Commissioner. When directed in writing by the Commissioner, temporary heat will be provided and paid for a period of time beyond 6 months past the Substantial Completion date. Payment for each month's temporary heat after the date of Substantial Completion acceptance will be made as part of the final payment.

3.6 STORM WATER CONTROL, DEWATERING FACILITIES AND DRAINS:

A. PUMPING:

1. Comply with requirements of authorities having jurisdiction. Maintain Project Site, excavations, and construction free of water. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of storm water from heavy rainfall.

2. Contractor must furnish and install all necessary automatically operated pumps of adequate capacity with all required piping to run-off agencies, so as to maintain the excavation, cellar floor, pits and exterior depressions and excavations free from accumulated water during the entire period of construction and up to the date of Final Acceptance of Work of the Contract.

3. All pumps must be maintained at all times in proper working order.

4. Dispose of rainwater in a lawful manner that will not result in flooding the Project or adjoining properties nor endanger permanent Work or temporary facilities.

5. Remove snow and ice as required to minimize accumulations.

3.7 TEMPORARY FIELD OFFICE FOR CONTRACTOR:

A. The Contractor must establish a temporary field office for its own use at the Site during the period of construction, at which readily available copies of all Contract Documents must be kept.

B. The field office must be located where it will not interfere with the progress of any part of the Work or with visibility of traffic control devices.

C. CONTRACTOR'S REPRESENTATIVE: There must be a responsible and competent representative of the Contractor in charge of the office who is duly authorized to receive orders and directions and to put them into effect.

D. Arrangements must be made by the Contractor whereby its representative may be readily available by telephone.

E. All temporary structures must be of substantial construction and neat appearance, and must be painted a uniform gray unless otherwise directed by the Commissioner.

F. CONTRACTOR'S SIGN: The Contractor must post and keep posted on the outside of its field office, office, exterior fence, or wall at Site of Work, a legible sign giving the full name of the company, address of the company and telephone number(s) of responsible representative(s) of the firm who can be reached in the event of an emergency at any time.

G. ADVERTISING PRIVILEGES: The City reserves the right to all advertising privileges. The Contractor must not cause any signs of any kind to be displayed at the Site unless specifically required herein or authorized by the Commissioner.

3.8 DDC FIELD OFFICE:

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8 A

A. OFFICE SPACE IN EXISTING BUILDING:

1. The Resident Engineer will arrange for office space for sole use in the building where Work is in progress. The Contractor must provide and install a lockset for the door to secure the equipment in the room. The Contractor must provide two (2) keys to the Resident Engineer. After completion of the Project the Contractor must replace the original lockset on the door and ensure its proper operation.

2. In addition to equipment specified in sub-section 3.8 D, the Contractor must provide, for exclusive use of the DDC Field Office, the following:

   a. Two (2) single pedestal desks, 42” x 32”; two (2) swivel chairs with arms and three (3) side chairs without arms to match desk. Two metal (2) lockers, single units, 15” x 18” x 78” overall including 6” legs. Lockers to have flat key locks with two (2) keys each, General Steel products or approved equal. Two (2) full ball bearing suspension four (4) drawer vertical legal filing cabinets with locks, approximately 52”H x 28 ½”D x 18”W.

   b. One (1) 9000 B.T.U air conditioner or as directed by Commissioner. Wiring for the air conditioner must be minimum No. 12 AWG fed from individual circuits in the fuse box.

   c. One (1) folding conference table, 96” x 30” and ten (10) folding chairs.

   d. Two (2) metal wastebaskets.

   e. One (1) fire extinguisher, one (1) quart vaporizing liquid type, brass, wall mounted by Pyrene No. C21 or approved equal.

   f. One (1) Crystal Springs water cooler with bottled water, Model No. LP14058 or approved equal to be furnished for the duration of the Project as required.

3. The Contractor must provide one (1) telephone, where directed and must pay all costs for telephone service for calls within the New York City limits for the duration of the Project.

4. All furniture and equipment, except computer equipment specified in sub-section 3.8 D.3, must

remain the property of the Contractor.

5. Computer workstation quantities must be provided as specified in sub-section 3.8 B 3-a for DDC Managed Projects, or sub-section 3.8 B 3-b for CM Managed Projects.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8 B

B. DDC FIELD OFFICE TRAILER:

1. GENERAL: The Contractor must, for the time frame specified herein, provide and maintain at its own cost and expense a DDC Construction Field Office and all related items as specified herein [hereinafter collectively referred to as the "DDC Field Office"] for the exclusive use of the Resident Engineer. The DDC Field Office must be located at the Project Site and must be solely dedicated to the Project. Provision of the DDC Field Office must commence within thirty (30) Days from Notice to Proceed (NTP) and must continue through forty-five (45) Days after Substantial Completion of the required construction at the Project Site. The Contractor must remove the DDC Field Office forty-five (45) Days after Substantial Completion of the required construction, or as otherwise directed in writing by the Commissioner.

2. TRAILER: The Contractor must provide at its own cost and expense a mobile office trailer for use as the DDC Field Office. The Contractor must install and connect all utility services to the trailer within thirty (30) Days from NTP. The trailer must have equipment in compliance with the minimum requirements hereinafter specified. Any permits and fees required for the installation and use of said trailer must be borne by the Contractor. The trailer including furniture and equipment therein, except computer equipment specified in sub-section 3.8D.3 herein, must remain the property of the Contractor.

3. Trailer must be an office-type trailer of the size specified herein, with exterior stairs at entrance. Trailer construction must be minimum 2 x 4 wall construction fully insulated with paneled interior walls, pre-finished gypsum board ceilings and vinyl tile floors.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8.B.3a or SUB-SECTION 3.8.B.3b.

a. <u>DDC Managed Project Trailer</u>: DDC Field Office Trailer Size, Layout and Computer Workstation:

1) Overall length: 32 Feet
Overall width: 10 Feet

2) Interior Layout:
Provide one (1) general office/conference room area and one (1) private office at one end of the trailer. Provide equipment and amenities as specified in sub-section 3.8.B herein.

iii. Computer Workstation: Provide one (1) complete computer workstation and one (1) tablet, as specified in sub-section 3.8.D herein, in the private office area as directed by the Resident Engineer.

b. <u>CM Managed Project Trailer</u>: DDC Field Office Trailer Size, Layout and Computer Workstation:

1) Overall length: 50 Feet
Overall width: 10 Feet

2) Interior Layout:

Provide one (1) large general office/conference room in the center of the

trailer and two (2) private offices, one (1) each at either end of the trailer. Provide equipment and amenities as specified in sub-section 3.8.B herein.

3) Computer Workstation:

Provide three (3) complete computer workstations and two (2) tablets as specified in sub-section 3.8.D herein. Provide one (1) each complete computer workstation in each private office and one (1) complete computer workstation at the secretarial position as directed by the Resident Engineer.

4. The exterior of the trailer must be lettered with black block lettering of the following heights with white borders:

CITY OF NEW YORK	2-1/2"
DEPARTMENT OF DESIGN AND CONSTRUCTION	3-3/4"
DIVISION OF PUBLIC BUILDINGS	3-1/2"
DDC FIELD OFFICE	2-1/2"

NOTE: In lieu of painting letters on the trailer, the Contractor may substitute a sign constructed of a good quality weatherproof material with the same type and size of lettering above.

5. All windows and doors must have aluminum insect screens. Provide wire mesh protective guards at all windows.

6. The interior must be divided by partitions into general and private office areas as specified herein. Provide a washroom located adjacent to the private office and a built-in wardrobe closet opposite the washroom. Provide a built-in desk in the private office(s) with fixed overhead shelf and clearance below for two (2) file cabinets.

7. Provide a built-in drafting or reference table, located in the general office/conference room, at least sixty (60) inches long by thirty-six (36) inches wide with cabinet below and wall type plan rack at least forty-two (42) inches wide.

8. The washroom must be equipped with a flush toilet, wash basin with two (2) faucets, medicine cabinet, complete with supplies and a toilet roll tissue holder. Plumbing and fixtures must be approved house type, with each appliance trapped and vented and a single discharge connection. Five (5) gallon capacity automatic electric heater for domestic hot water must be furnished.

9. HVAC: The trailer must be equipped with central heating and cooling adequate to maintain a temperature of seventy-two (72) degrees during the heating season and seventy-five (75) degrees during the cooling season when the outside temperature is five (5) degrees F. winter and eighty-nine (89) degrees F. summer.

10. Interior lighting must be provided via ceiling mounted fluorescent lighting fixtures to a minimum level of fifty (50) foot candles in the open and private office(s) along with sufficient lighting in the washroom. Broken and burned out lamps must be replaced by the Contractor. A minimum of four (4) duplex convenience outlets must be provided in the open office and two (2) each in the private office(s). These outlets must be in addition to special outlet requirements for computer stations, copiers, HVAC unit, etc. Exterior lighting must be provided for the security of staff and visitors, with lighting provided at all entrances and as directed by the Commissioner.

11. Electrical service switch and panel must be adequately sized for the entire trailer load. Provide dedicated circuits for HVAC units, hot water heater, copiers and other equipment as required. All wiring and installation must conform to the New York City Electrical Code.

12. The following movable equipment must be furnished:

a. Two (2) single pedestal desks, 42" x 32"; two (2) swivel chairs with arms and three (3) side chairs without arms to match desk. Two (2) full ball bearing suspension four (4) drawer

vertical legal filing cabinets with locks and two (2) full ball bearing two (2) drawer vertical legal filing cabinets in each private office located below built-in desk.

b. One (1) folding conference table, 96” x 30” and ten (10) folding chairs.

c. Three (3) metal wastebaskets.

d. One (1) fire extinguisher one (1) quart vaporizing liquid type, brass, wall mounted by Pyrene No. C21 or approved equal.

e. One (1) Crystal Springs water cooler with bottled water, Model No. LP14058 or approved equal to be furnished for the duration of the Contract as required.

13. TRAILER TEMPORARY SERVICE: Plumbing and electrical Work required for the trailer will be furnished and maintained as below.

a. PLUMBING WORK: The Contractor must provide temporary water and drainage service connections to the DDC Field Office trailer for a complete installation. Provide all necessary soil, waste, vent and drainage piping.

Contractor to frost-proof all water pipes to prevent freezing.

1) REPAIRS, MAINTENANCE: The Contractor must provide repairs for the duration of the Project until the trailer is removed from the Site.

2) DISPOSITION OF PLUMBING WORK: At the expiration of the time limit set forth in sub-section 3.8 B 1 herein, the temporary water and drainage connections and piping to the DDC Field Office trailer must be removed by the Contractor and must be plugged at the mains. All piping must become the property of the Contractor for plumbing Work and must be removed from the Site, all as directed. All repair Work due to these removals must be the responsibility of the Contractor.

b. ELECTRICAL WORK:

1) The Contractor must furnish, install and maintain a temporary electric feeder to the DDC Field Office trailer immediately after it is placed at the job Site.

2) The temporary electrical feeder and service switch/fuse must be adequately sized based on the trailer load and installed per the New York City Electrical Code and complying with utility requirements.

3) Make all arrangements and pay all costs to provide electric service.

4) The Contractor must pay all costs for current consumed and for maintenance of the system in operating condition, including the furnishing of the necessary bulb replacements lamps, etc., for the duration of the Project and for a period of forty-five (45) Days after the date of Substantial Completion.

5) Disposition of Electric Work: At the expiration of the time limit set forth, the temporary feeder, safety switch, etc., must be removed and disposed of as directed.

6) All repair Work due to these removals must be the responsibility of the Contractor.

c. MAINTENANCE:

1) The Contractor must provide and pay all costs for regular weekly janitor service and furnish toilet paper, sanitary seat covers, cloth towels and soap and maintain the DDC Field Office in first-class condition, including all repairs, until the trailer is removed from the Site.

2) Supplies: The Contractor must be responsible for providing (1) all office supplies, including without limitation, pens, pencils, stationery, filtered drinking water and sanitary

supplies, and (2) all supplies in connection with required computers and printers, including without limitation, an adequate supply of blank CD's/DVD's, storage boxes for blank CDs/DVDs, and paper and toner cartridges for the printer.

3) Risk of Loss: The entire risk of loss with respect to the DDC Field Office and equipment must remain solely and completely with the Contractor. The Contractor must be responsible for the cost of any insurance coverage determined by the Contractor to be necessary for the field office.

4) At forty-five (45) Days after the date of Substantial Completion, or sooner as directed by the Commissioner, the Contractors must have all services disconnected and capped to the satisfaction of the Commissioner. All repair Work due to these removals must be the responsibility of the Contractor.

d. TELEPHONE SERVICE: The Contractor must provide and pay all costs for the following telephone services for the DDC Field Office trailer:

1) Separate telephone lines for one (1) desk phone in each private office.

2) One (1) wall phone (with six (6) foot extension cord) at plan table.

3) Telephone and internet access in each private office. Telephone service must include voice mail. All electronic voicemail messages must be automatically forwarded as email attachments, to allow for the voicemails to be played remotely.

4) A remote bell located on outside of trailer.

5) The telephone service must continue until the trailer is removed from the Site.

e. SECURITY CAMERAS: Wi-Fi enabled security cameras must be provided at all entrances and exits, except for fire escapes / emergency stairwells, which do not require cameras. One security camera must be provided for the interior of the DDC Field Office, with the location to be determined by the Commissioner. Cameras must be minimum 1080p video resolution. Cameras must have internet cloud storage, with all videos stored for a minimum of two weeks. The cloud storage must be accessible via desktop or mobile. Cameras may be hardwired for power or battery powered; battery powered cameras must have the batteries changed by the Contractor as required to ensure no lapses of service. Signs must be posted indicating that the area is under video surveillance.

f. PERMITS: The Contractor must make the necessary arrangements and obtain all permits and pay all fees required for this Work.

C. RENTED SPACE: The Contractor has the option of providing, at its cost and expense, rented office or store space in lieu of trailer. Said space must be in the immediate area of the Project and have adequate plumbing, heating and electrical facilities. Space chosen by the Contractor for the DDC Field Office must be approved by the Commissioner before the area is rented. All insurance, maintenance and equipment, including computer workstations and security cameras specified in sub-section 3.8 D in quantities required as specified in sub-section 3.8 B 3 for the DDC Field Office trailer, must also apply to rented spaces.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.8 D

D. ADDITIONAL EQUIPMENT FOR THE DDC FIELD OFFICE:

1. Photocopying Machine: Stand-alone, heavy duty, electric, dry-process color photocopying type with color scan and send capability via email, a minimum production rate of seventy (70) pages per minute and an adequate supply of copy paper, toner, etc. The machine must be capable of duplex copying paper sizes of 8-1/2 x 11 inches, 8-1/2 x 14 inches and 11 x 17 inches, and have separate trays for each paper size. It must have a document feeder, collator, stapler, and the capability to reduce/enlarge copies between each paper size. The supply of each size copy paper, toner, etc.

must be replenished and the machines must be maintained for the duration of the Contract by the Contractor as required by the Resident Engineer. Make and model can be Minolta, Canon, IBM, Epson, or an approved equivalent, and must be networked to the office computers for printing capability. Copier must remain at job Site until the DDC Field office trailer is removed from the Site.

2. The Contractor must furnish a fax service and a telephone answering service (or computer based equivalent system) at commencement of the Project for the exclusive use of the DDC Field Office. All materials must be new, sealed in manufacturer's original packaging and must have manufacturers' warrantees. All items must remain the property of the City of New York at the completion of the Project.

3. COMPUTER WORKSTATION: The Contractor must provide one (1) complete computer workstation, in quantities specified in sub-section 3.8.B.3, as specified herein:

   a. Hardware/Software Specification:

      1) Computer Equipment: Computers must be provided for all Contracts that have a total Consecutive Calendar Days (CCD) for construction duration, as set forth in Schedule "A", of 180 CCD's or greater. Contracts of lesser duration must not require computers.

      2) Computers furnished by the Contractor for use by City Personnel for the duration of the Contract must be in accordance with the Specific Requirements contained herein, must remain the property of the City of New York at the completion of the Project, and must meet the following minimum requirements:

      3) Personal Computers – Personal Computers must meet the requirements of the US General Services Administration (GSA) Government-Wide Strategic Solutions (GSS) Standard Laptop, Desktop, and Tablet Specifications, V7. (Available online at (Government-Wide Strategic Solutions (GSS) Version 7 Specifications | NITAAC (nih.gov)).

         (a) Computer type for Personal Computers to be “Desktop Small Form Factor.” Computer type for tablet to be “Tablet”
         (b) The following components listed as optional in the GSA specification must be provided with each personal computer: monitor, speakers, optical drive, smart card reader, webcam, and headset.
         (c) The following additional software must be provided with licenses for each computer:
            1. Adobe Acrobat Pro DC or Bluebeam Revu
            2. Microsoft Office Professional
            3. Autodesk AutoCAD LT
            4. Anti-virus software
            5. Microsoft Visio (only one license required per field office)

      iv. DDC Field Office Specs: DDC Field Offices requiring computers must be provided with the following:

         a) One (1) broad-band internet service account. See table below for minimum required upload and download speeds. Telephone service should be bundled together with Internet connectivity. Because of throughput requirements Verizon FIOS is the preferred connectivity provider where available.

Office Personnel #	Download Speeds (*Minimum*)	Upload Speeds (*Minimum*)
1 – 5	10 Mbps	15 Mbps

6 – 10	20 Mbps	15 Mbps
11 – 15	25 Mbps	15 Mbps
16 – 20	50 Mbps	15 Mbps

This account will be active for the life of the Project. The e-mail name for the account must be the DDC Field Office/Project ID (preferably Gmail or Outlook e.g. ABC1234@gmail.com).

b) One (1) 600 DPI HP Color Laser Jet Printer (twelve (12) pages per minute or faster) with one (1) Extra Paper (Legal Size) (Not required if photocopying machine prints in color).

c) All necessary cabling for equipment specified herein

d) Storage Boxes for Blank CD's

e) Printer Table

f) UPS/Surge Suppressor combo

g) Ten (10) USB Thumb (or Flash) Drives – sixteen (16) GB each

5) All computers required for use in the DDC Field Office must be delivered, installed, and setup in the Field Office by the Contractor.

6) All Computer Hardware must come with a three (3) year warranty for on-site repair or replacement. Additionally, and notwithstanding any terms of the warranty to the contrary, the Contractor is responsible for rectifying all computer problems or equipment failures within one (1) business day.

7) An adequate supply of blank CDs/DVDs, and paper and toner cartridges for the printer must be provided by the Contractor and must be replenished by the Contractor as required by the Resident Engineer.

8) It is the Contractor's responsibility to ensure that electrical service and phone connections are also available at all times; that is, the Field Office Computer(s) is to be powered and turned on twenty-four (24) hours each Day.

9) Broadband connectivity is preferred at each field office location. Please take into consideration that an extra phone line dedicated to the modem must be ordered as part of the Contract unless Internet broadband connectivity, via Cable or DSL, is available at the planned field office location. Any questions regarding this policy should be directed to the Assistant Commissioner of ITS at 718-391-1761.

E. HEAD PROTECTION (HARD HATS):

1. The Contractor must provide a minimum of ten (10) standard protective helmets for the exclusive use of DDC personnel and their visitors. Helmets must be turned over to the Resident Engineer and kept in the DDC Field Office.

2. Upon completion of the Project, the helmets must become the property of the Contractor.

F. PAYMENT FOR DDC FIELD OFFICE

1. The DDC Field Office will be paid monthly on a unit price basis.

2. MEASUREMENT. The quantity to be measured for payment under this item will be the number of months that the DDC Field Office is available for occupancy by the Commissioner during the period of the Project. Payment will begin the first month that the DDC Field Office is fully equipped, serviced

as specified, and made available for occupancy. The DDC Field Office is to be continuously made available and monthly payments will continue for the duration of the Project through a period not to exceed 6 months past the Substantial Completion date. When directed in writing by the Commissioner, the DDC Field Office will be provided and paid for a period of time beyond 6 months past the Substantial Completion date. Payment for each month's occupancy after the date of Substantial Completion acceptance will be made as part of the final payment. Monthly payments may be terminated on a specified date prior to acceptance of the Project by written notification by the Commissioner that such office will no longer be required on the Project.

3. PRICE TO COVER. The unit price bid per month for the item DDC Field Office shall include the cost of furnishing all labor, materials, equipment, ground rental, fire and theft insurance, and utility charges necessary to complete the work of providing or constructing the field office; making all necessary electrical, water, sewer, and other connections required to make the above facilities operative; payment of all rental costs; furnishing and paying for heating fuel, as required; all electrical energy; private telephone services; staples, as specified; and all necessary incidentals to complete the work all in accordance with the specifications and the directions of the Commissioner.

3.9 MATERIAL SHEDS:

A. Material sheds used by the Contractor for the storage of its materials must be kept at locations which will not interfere at any time with the progress of any part of the Work or with visibility of traffic control devices.

B. The Contractor must store combustible materials apart from the facility.

3.10 TEMPORARY ENCLOSURES:

A. The Contractor must provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weather tight enclosure for building exterior.

B. Where heating or cooling is needed and Permanent Enclosure is not complete, the Contractor must insulate temporary enclosures.

3.11 TEMPORARY PARTITIONS:

A. The Contractor must provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate occupied tenant areas from fumes and noise, including, but without limitation:

1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant plywood on construction operations side.

2. Construct dustproof partitions with 2 layers of 3-mil (0.07-mm) polyethylene sheet on each side. Cover floor with two (2) layers of 3-mil (0.07-mm) polyethylene sheet, extending sheets eighteen (18) inches (460 mm) up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant plywood.

   a. Construct vestibule and airlock at each entrance through temporary partition with not less than forty-eight (48) inches (1219 mm) between doors. Maintain water-dampened foot mats in vestibule.

3. Insulate partitions to provide noise protection to occupied areas.

4. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.

5. Protect air-handling equipment.

6. Weather strip openings.

7. Provide walk-off mats at each entrance through temporary partition.

3.12 TEMPORARY FIRE PROTECTION:

A. The Contractor must install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with National Fire Protection Association (NFPA) Standard 241.

B. Smoking in all areas is prohibited.

C. The Contractor must supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.

D. The Contractor must develop and supervise an overall fire-prevention and protection program for personnel at Project Site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

E. The Contractor must provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.13

3.13 WORK FENCE ENCLOSURE:

A. The Contractor must furnish, erect and maintain a wood construction or chain-link fence to the extent shown on the Contract Drawings or required by the Work enclosing the entire Project on all sides. All materials used must be new. Any permit required for the installation and use of said fence and costs must be borne by the Contractor.

B. WOOD FENCE must be seven (7) feet high with framing construction of yellow pine, using 4" x 4" approved preservative-treated posts on not more than 6'-0" centers, with three (3) rails of at least 2" x 4" size to which must be secured minimum 1/2 inch thick exterior grade plywood. Posts must be firmly fixed in the ground at least 30" and thoroughly braced. Top edge of fence must be trimmed with a rabbeted edge mould. Provide on the street traffic sides of fence, observation openings as directed.

1. GATES: The Contractor must provide an adequate number of double gates, complete with hardware, located as approved by the Resident Engineer. Double gates must have a total clear opening of 14'-0" with two (2) 7'-0" hinged swinging sections. Hanging posts must be 6" x 6" and must extend high enough to receive and be provided with tension or sag rods for the swinging sections.

2. PAINTING: The fence and gates must be entirely painted on the street and public sides with one (1) coat of exterior primer and one (1) top coat of exterior grade acrylic-latex emulsion paint. Black stenciled signs reading "POST NO BILLS" must be painted on fence with three (3) inch high letters on twenty-five (25) foot spacing for the entire length of fence on street traffic sides. Signs must be stenciled five (5) feet above the sidewalk.

C. CHAIN-LINK FENCING must be minimum two (2) inch thick, galvanized steel, chain-link fabric fencing; eight (8) feet high with galvanized steel pipe posts; minimum 2-3/8-inch Outside Diameter (OD) line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Fence must be accurately aligned and plumb, adequately braced and complete with gates, locks and hardware as required. Under no condition must fencing be attached or anchored to existing construction or trees.

D. ADDITIONAL REQUIREMENTS:

1. It must be the obligation of the Contractor to remove all posters, advertising signs, and markings, etc., immediately.

2. Should the fencing be required to be relocated during the course of the Contract, it must be done by

the Contractor at no additional cost to the City.

3. Where sidewalks are used for "drive over" purposes for Contractor vehicles, a suitable wood mat or pad must be provided for protection of sidewalks and curbs.

4. Where required, make provision for fire hydrants, lampposts, etc.

E. REMOVAL: When directed by the Commissioner, the fence must be removed.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.14

3.14 RODENT AND INSECT CONTROL:

A. DESCRIPTION: The Contractor must provide all labor, materials, plant and equipment, and incidentals required to survey and monitor rodent activity and to control any infestation or outbreak of rodents, rats, mice, water beetles, roaches and fleas within the Project area. Special attention should be paid to the following conditions or areas:

1. Wet areas within the Project area, including all temporary structures.

2. All exterior and interior temporary toilet structures within the Project area.

3. All Field Offices and shanties within the Project area of all Subcontractors and DDC.

4. Wherever there is evidence of food waste and/or discarded food or drink containers, in quantity, that would cause breeding of rodents or the insects herein specified.

5. Any other portion of the Site requiring such special attention.

B. MATERIALS:

1. All materials must be approved by the New York State Department of Environmental Conservation (DEC) and comply with the New York City Health Code, OSHA and the laws, ordinances and regulations of state and federal agencies pertaining to such chemical and/or materials.

C. PERSONNEL:

1. All pest control personnel must be supervised by an exterminator licensed in categories 7A and 8.

D. METHODS:

1. Application and dosage of all materials must be done in strict compliance with the manufacturer's recommendations.

2. Any unsanitary conditions, such as uncollected garbage or debris, resulting from all Contractor's activities, which will provide food and shelter to the resident rodent population must be corrected by the Contractor immediately after notification of such condition by the Resident Engineer.

E. RODENT CONTROL WORK:

1. In wetlands, woodlands, and areas adjacent to a stream, special precautions must be taken to protect water quality and to ensure the safety of other wildlife. To prevent poisoned bait from entering streams, no poisoned bait must be used in areas within seventy-five (75) feet of all stream banks. Live traps must be used in these seventy-five (75) foot buffer zone areas and within wetland and woodland areas.

2. In areas outside the seventy-five (75) foot zone of protection adjacent to streams, and in areas outside wetlands and woodlands, tamper proof bait stations with poisoned bait must be placed during the period of construction and any consumed or decomposed bait must be replenished as directed.

3. At least one (1) month prior to initiation of the construction Work, and periodically thereafter, live traps and/or rodenticide bait in tamper proof bait stations, as directed above, must be placed at locations that do not allow access to pets, human beings, children and other non-target species, particularly wildlife (for example-birds) in the Project area.

4. The Contractor must be responsible for collecting and disposing of all trapped and poisoned rodents found in live traps and tamper-proof bait stations. The Contractor must also be responsible for posting and maintaining signs announcing the baiting of each particular location.

5. The Contractor must be responsible for the immediate collection and disposal of any visible rodent remains found on streets or sidewalks within the Project area.

6. It is anticipated that public complaints will be addressed to the Commissioner. The Contractor, where directed by the Commissioner, must take appropriate actions, like baiting, trapping, proofing, etc., to remedy the source of complaint within the next six (6) hours of normal working time which is defined herein for the purposes of this section as 7 A.M. to 6 P.M. on Mondays through Saturdays.

7. Emergency service during the regular workday hours (Monday through Friday) must be rendered within twenty-four (24) hours, if requested by the Commissioner, at no additional cost to the City.

F. EDUCATION & NOTICES:

1. The Contractor must post notices on all Construction Bulletin Boards advising workers, employees, and residents to call the DDC Field Office to report any infestation or outbreak of rodents, rats, mice, water beetles, roaches and fleas within the Project area. The Contractor must provide and distribute literature pertaining to Integrated Pest Management (IPM) techniques of rodent control to affected businesses and superintendents of nearby residential buildings to ensure their participation in maintaining their establishments free of unsanitary conditions, harborage removal and rodent proofing.

2. Prior to application of any chemicals, the Contractor must furnish to the Commissioner copies or sample labels for each pesticide, antidote information, and Material Data Safety Sheets (MSDS) for each chemical used.

G. RECORDS

1. The Contractor must keep a record of all rodent and waterbug infestation surveys conducted and make available, upon request, to the Commissioner. The findings of each survey must include, but not be limited to, recommended IPM techniques, like baiting, trapping, proofing, etc., proposed for rodent and waterbug pest control.

2. The Contractor must maintain records of all locations baited along with the type and quantity of rodenticide and insecticide bait used, using the NYC Pesticide Use Reporting System (“NYCPURS”). These records will be kept by the Commissioner. A weekly report from NYCPURS must be prepared, signed and certified by the approved licensed exterminator retained by the Contractor. Such reports must be submitted to the Commissioner each week, prior to payment.

H. PAYMENT FOR RODENT AND INSECT CONTROL

1. Payment for rodent and inspect control will be made on a unit price basis.

2. The quantity to be measured for payment under this item will be the number of months (to the nearest 1/4 month increment) that the Contractor satisfactorily provides for rodent and insect

control in accordance with these specifications.

3. The unit price bid per month for rodent and insect control must include the cost of furnishing all labor, materials, plant, equipment, insurance and incidentals required to provide rodent and insect control, all in accordance with the Contract Drawings, these specifications, and the directions of the Commissioner.

3.15 PLANT PEST CONTROL REQUIREMENTS AND TREE PROTECTION REQUIREMENTS:

A. Plant Pest Control Requirements: The Contractor and its Subcontractors, including the Certified Arborist described below, must comply with all federal and New York State laws and regulations concerning Asian Longhorned Beetle (ALB) management, including protocols for ALB eradication and containment promulgated by the New York State Department of Agriculture and Markets (NYSDAM). The Contractor is referred to: (1) Part 139 of Title 1 NYCRR, Agriculture and Markets Law, Sections 18, 164 and 167, as amended, and (2) State Administrative Procedure Act, Section 202, as amended.

1. All tree Work performed within the quarantine areas must be performed by NYSDAM certified entities. Transportation of all host material, living, dead, cut or fallen, inclusive of nursery stock, logs, green lumber, stumps, roots, branches and debris of a half inch or more in diameter from the quarantine areas is prohibited unless the Contractor or its Subcontractor performing tree Work has entered into a compliance agreement with NYSDAM. The terms of said compliance agreement must be strictly complied with. Any host material so removed must be delivered to a facility approved by NYSDAM. For the purpose of this Contract, host material must be ALL species of trees.

2. Any host material that is infested with the ALB must be immediately reported to NYSDAM for inspection and subsequent removal by either State or City contracts, at no cost to the Contractor.

3. Prior to commencement of tree Work, the Contractor must submit to the Commissioner a copy of a valid ALB compliance agreement entered into with NYSDAM and the Contractor or its Subcontractor performing tree Work. If any host material is transported from the quarantine area the Contractor must immediately provide the Commissioner with a copy of the New York State 'Statement of Origin and Disposition' and a copy of the receipt issued by the NYSDAM approved facility to which the host materials are transported.

4. Quarantine areas, for the purpose of this Contract, must be defined as all five boroughs of the City of New York. In addition, prior to the start of any tree Work, the Contractor must contact the NYC Department of Parks & Recreation's (DPR) Director of Landscape Management at (718) 699-6724, to determine the limits of any additional quarantine areas that may be in effect at the time when tree Work is to be performed. The quarantine area may be expanded by federal and state authorities at any time and the Contractor is required to abide by any revisions to the quarantine legislation while working on this Contract. For further information please contact: NYSDAM (631) 288-1751.

B. Tree Protection Requirements: The Contractor must retain a Certified Arborist, as defined by DPR regulations, to provide the services described below.

1. Surveys and Reports: The Certified Arborist must, at the times indicated below, conduct a survey and prepare a plant material assessment report which includes: (1) identification, by species and pertinent measurements, of all plant material located on the Project Site, or in proximity to the Project Site, as described below, including all trees, significant shrubs and/or planting masses; (2) identification and plan for the containment of plant pests and pathogens, including the ALB, as described in paragraph A above; and (3) evaluation of the general health and condition of any infected plant material.

2. Frequency of Reports: The Certified Arborist must conduct a survey and provide a plant material assessment report at two (2) points in time: (1) prior to the commencement of construction Work; and (2) at the time of Substantial Completion. In addition, for projects exceeding twenty-four (24) months in duration, the Certified Arborist must conduct a survey and prepare a report at the midpoint of

construction. Copies of each plant material assessment report must be submitted to the Resident Engineer within two (2) weeks of the survey.

3. Proximity to Project Site: Off-site trees, significant shrubs and/or planting masses must be considered to be located in proximity to the Project Site under the circumstances described below.

   a. The tree trunk, significant shrub, or primary cluster of stems in a planting mass is within fifty (50) feet of the project's Contract Limit Lines (CLLs) or Property Lines (PLs).

   b. Any part of the tree or shrub stands within fifty (50) feet of: (a) a path for Site access for vehicles and/or construction equipment; or (b) scaffolding to be erected for construction activity, including façade remediation projects.

   c. The Certified Arborist determines that the critical root zone (CRZ) of an off-site tree, significant shrub, or primary cluster of stems in a planting mass extends into the Project Site, whether or not that plant material is located within the fifty (50) foot inclusionary perimeter as outlined above.

4. Tree Protection Plan: The Certified Arborist must prepare, and the Contractor must implement, a Tree Protection Plan for all trees that may be affected by any construction Work, excavation or demolition activities, including without limitation: (1) on-site trees, (2) street trees, as defined below, (3) trees under DPR jurisdiction as determined by the NYC Department of Transportation, and (4) all trees that are located in proximity to the Project Site, as defined above. The Tree Protection Plan must comply with the DPR rules, regulations and specifications. The Contractor is referred to Chapter 5 of Title 56 of the Official Compilation of the Rules of the City of New York. Copies of the Tree Protection Plan must be submitted to the Resident Engineer prior to the commencement of construction. Implementation of the Tree Protection Plan for street trees and trees under DPR jurisdiction must be in addition to any tree protection requirements specified or required for the Project Site. For the purpose of this article, a "street tree" means the following: (1) a tree that stands in a sidewalk, whether paved or unpaved, between the curb lines or lateral lines of a roadway and the adjacent property lines of the Project Site, or (2) a tree that stands in a sidewalk and is located within fifty (50) feet of the intersection of the Project's Site's PL with the street frontage property line.

C. No Separate Payment: No separate payment must be made for compliance with Plant Pest Control Requirements or Tree Protection Requirements. The cost of compliance with Plant Pest Control Requirements and Tree Protection Requirements must be deemed included in the Contractor's bid for the Project.

3.16 PROJECT IDENTIFICATION SIGNAGE:

A. The Contractor must provide, install and maintain Project identification and other signs where indicated to inform public and individuals seeking entrance to the Project.

B. In order to properly convey notice to persons entering upon a City construction Site, the Contractor must furnish and install a sign at the entrance (gates) as follows:

NO TRESPASSING

AUTHORIZED PERSONNEL ONLY

C. If no construction fence exists at the Site, this notice must be conveyed by incorporating the above language into safety materials (barriers, tape, and signs).

D. Provide temporary, directional signs for construction personnel and visitors.

E. Maintain and touch up signs so that they are legible at all times.

3.17 PROJECT CONSTRUCTION SIGN AND RENDERING:

A. PROJECT SIGN:

1. Responsibility: The Contractor must produce and install one (1) Project sign which must be posted and maintained upon the Project Site at a place and in a position directed by the Commissioner. The Contractor must protect the sign from damage during the continuance of Work under the Contract and must do all patching of lettering, painting and bracing thereof necessary to maintain the sign in first class condition and in proper position. Prior to fabrication, the Contractor must submit an 8-1/2” x 11” color match print proof from the sign manufacturer of the completed sign for approval by the Commissioner.

2. Sign Quality: The Contractor must provide all materials required for the production of the sign as specified herein. Workmanship must be of the best quality, free from defects and must be produced in a timely manner.

3. Schedule: Upon Project mobilization, the Contractor must commence production and installation of the sign.

4. Removal: At the completion of all Work under the Contract, the Contractor must remove and dispose of the Project sign away from the Site.

5. Sign construction:

   a. Frame: The frame must be from quality dressed 2”x2” pine, fire retardant, pressure treated lumber, that surrounds the inside back edge of the sign. The sign must have one (1) intermediate vertical and two (2) diagonal supports, glued and screwed for rigidity. Frame must be painted white with two (2) coats of exterior enamel paint, prior to mounting of sign panel.

   b. Edging: U-shaped, twenty-two (22) gauge aluminum edging, with a white enameled finish to match sign background, must run around entire edging of sign panel and frame. Corners must be mitered for a tight fit. Channel dimensions must be 1” inch (overlap to sign panel face) x 1 3/4" (or as required across frame depth) x 1" (back overlap).

   c. Sign Panel: 4' x 8' panel must be constructed in one (1) piece of fourteen (14) gauge (.0785") 6061-T6 aluminum. This panel must be pre-finished both sides with a glossy white baked-on enamel finish and be flush with edge of 2" x 2" wood frame. Samples must be submitted for approval.

   d. Fastening: Fasten sign panel to wood frame using cadmium plated no. 8 sheet metal screws at ½" below edge of panel and 8" on center. The U-shaped aluminum channel must be applied over the wood frame edge and fastened with cadmium plated no. 8 sheet metal screws at 12" on center around the entire perimeter.

6. Sign Graphics:

   a. A digital file of the Project sign will be provided to the Contractor by the Commissioner’s representative for printing. The Commissioner’s representative must insert the Project name and names and titles of personnel (three (3) or more) and any other required information associated with the Project. All signs may include a second panel for a Project rendering as described in sub-section 3.17.B herein.

   b. The digital file must be reproduced at the Sign Panel size of 4’ x 8’ on 3M High Performance Vinyl or approved equal. The 3M High Performance Vinyl or equivalent must be guaranteed for nine (9) years. Guarantee must cover fading, peeling, chipping or cracking. The sign manufacturer is

required to maintain all specified Pantone Matching System (PMS) type and other composition elements represented in the digital file of the Project sign.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SETION 3.17 B

B. PROJECT RENDERING:

1. Responsibility: In addition to the Project sign, the Contractor must furnish and install one (1) sign showing a rendering of the Project. A digital file of the Project rendering will be provided to the Contractor by the Commissioner's representative. From an approved image file provided by DDC, the Project rendering is to be sized, printed, and mounted in an identical manner as described in sub-section 3.17.A above for the Project sign. A color match print proof from the sign manufacturer of the rendering sign printed from the supplied file is to be submitted to DDC for approval before fabrication. The rendering sign is to be posted at the same height as the Project sign. Where possible, the rendering sign must be mounted with a perfect match of the short sides of the rectangle so that the rendering sign and the Project sign together will create one long rectangle.

2. Removal: At the completion of all Work under the Contract, the Contractor must remove and dispose of the Project rendering away from the Site.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.18

3.18 SECURITY GUARDS/FIRE GUARDS ON SITE:

A. SECURITY GUARDS (WATCHMEN):

1. The Contractor must provide a competent security guard service on the Site, beginning on the date on which the Contractor commences actual construction Work, or on such earlier date on which there is activity at the Site related to the Work, including without limitation, delivery of materials or construction set-up. The Contractor must continue to provide such security guard service until the date on which it completes all required Work at the Site, including all punch list Work, as certified in writing by the Resident Engineer, or earlier if so directed in writing by the Commissioner. Throughout the specified time period, there must be no less than one (1) security guard on duty every day, including Saturdays, Sunday and holidays, twenty-four (24) hours a day, except between the hours of 8:00 A.M. and 4:00 P.M. on any day that the Contractor is present. This exception during the working day must not apply after the finishing painting of the plaster Work is commenced; thereafter, not less than one (1) security guard must be on duty continuously, twenty-four (24) hours a day.

2. Every security guard must be required to hold a "Certificate of Fitness" issued by FDNY. Every security guard must, during his/her tour of duty, perform the duties of fire guard in addition to his/her security obligations.

3. Should the Commissioner find that any security guard is unsatisfactory, such guard must be replaced by the Contractor upon the written demand of the Commissioner.

4. Each security guard furnished by the Contractor must be instructed by the Contractor to include in his/her duties the entire construction Site including the Field Office, temporary structures, and equipment, materials, etc.

5. Should the Contractor or any other Subcontractor consider the security requirements outlined above inadequate, the Contractor must provide such additional security as it thinks necessary, after obtaining the written consent of the Commissioner. The additional cost of such approved increased protection will be paid by the Contractor.

6. Nothing contained in this sub-section must diminish in any way the responsibility of the Contractor and each Subcontractor for its own Work, materials, tools, equipment, nor for any of the other risks and obligations outlined hereinbefore in this Article.

B. COSTS: The Contractor must employ security guards/fire guards throughout the specified time period, except as otherwise modified by the detailed Specifications and as approved by the Commissioner, for the purpose of safeguarding and protecting the Site. All costs for security guards/fire guards must be borne by the Contractor.

C. RESPONSIBILITY: The Contractor and its Subcontractors will be responsible for safeguarding and protecting their own work, materials, tools and equipment.

D. PAYMENT FOR SECURITY GUARDS

1. Payment for security guards will be made on a unit price basis.

2. The quantity to be measured for payment under this item will be the number of months (to the nearest 1/4 month increment) that the Contractor satisfactorily provides for security guards in accordance with these specifications.

3. The unit price bid per month for security guards must include the cost of furnishing all labor, materials, plant, equipment, insurance and incidentals required to provide security guards, all in accordance with the Contract Drawings, these specifications, and the directions of the Commissioner.

3.19 SAFETY:

A. The Contractor, in compliance with requirements of Section 01 35 26, SAFETY REQUIREMENTS PROCEDURES, must provide and maintain all necessary temporary closures, guard rails, and barricades to adequately protect all workers and the public from possible injury. Any removal of these items, during the progress of the Work, must be replaced by the Contractor at no additional cost to the City.

END OF SECTION 01 50 00

SECTION 01 54 11
TEMPORARY ELEVATORS AND HOISTS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes the following:
   1. Temporary Use, Operation and Maintenance of Elevators during Construction
      a. For new buildings up to and including fifteen (15) stories
      b. For new buildings over fifteen (15) stories
      c. For existing buildings
   2. Temporary Construction Hoists and Hoistways (For Material and Personnel)

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY

B. Section 01 42 00 REFERENCES

C. Section 01 50 00 TEMPORARY FACILITIES AND CONTROLS

D. Section 01 54 23 TEMPORARY SCAFFOLDS AND SWING STAGING

E. Section 01 77 00 CLOSE OUT PROCEDURES

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.1

3.1 TEMPORARY USE, OPERATION AND MAINTENANCE OF ELEVATORS DURING CONSTRUCTION FOR NEW BUILDINGS UP TO AND INCLUDING FIFTEEN (15) STORIES:

A. INSTALLATION: The Contractor must install, complete, operate, and maintain in good working order, as indicated herein, one (1) selected main elevator for the transport of employees of the Contractor and/or its Subcontractors, representatives of DDC, and other governmental agencies having jurisdiction of Work at the Project. The Contractor must furnish, install, and maintain such elevator in good working order, including all necessary hoisting ropes, governor cables, traveling conductor cables, operating devices, temporary hand reset target annunciators, temporary signal devices, and all other permanent or temporary parts. The installation, operation and maintenance of the temporary elevator and all equipment and/or parts utilized in connection therewith must be in accordance with the rules and regulations of all agencies and/or entities having jurisdiction over elevators in temporary use.

B. RESPONSIBILITY: The Contractor must be responsible for any injury to persons or damage to property arising out of the temporary elevator and all equipment and/or parts utilized in connection therewith.

C. COSTS: The Contractor must be responsible for all costs in connection with the temporary elevator, including without limitation:

1. Installing and operating the temporary elevator;
2. Maintaining the temporary elevator in clean and proper operating condition, including the cost of lubricants and/or parts for such maintenance;
3. Performing all Work in pits, shaft ways and machine rooms necessary for the operation of the temporary elevator;
4. Replacing the temporary elevator or any equipment or parts utilized in connection therewith, if required, due to damage, destruction, or excessive wear or corrosion, except for the replacement of hoisting ropes as set forth below;
5. Performing all required electrical Work in connection with the temporary elevator;
6. Providing all electric power required to operate the temporary elevator;
7. Providing all necessary conduit and wiring connections for the proper operation and signaling of the temporary elevator; and
8. Providing all labor for the operation and maintenance of the temporary elevator, including on an overtime basis if necessary.

The total Contract price must include all costs in connection with the temporary elevator, including without limitation, the costs specified herein.

D. COMMENCEMENT OF SERVICE: The Contractor must begin to provide temporary elevator service using the selected main passenger elevator no later than eight (8) weeks (forty (40) Days) after the machine room roof slab, or that portion of it surrounding the elevator shaft, has been placed. No later than three (3) weeks (fifteen (15) Days) after the machine room roof slab has been placed, or that portion of it surrounding the elevator shaft, the following Work must be completed:

1. The shaft must be completely enclosed by either a permanent or temporary enclosure meeting all building code requirements.
2. The machine room must be completely watertight either by permanent or temporary construction. Beams or other devices, either permanent or temporary, must be provided to enable the safe and practicable hoisting of the elevator machinery for installation.
3. On all floors at the shaft way entrances to the elevator, the Contractor must install solid substantial frames, either sliding or swing doors with substantial hardware and door locks, and any necessary approved wire mesh barricades for adjacent shaft ways.
4. The Contractor must furnish and install solid, substantial enclosures at front, back, sides and top of car platform enclosure, with an emergency exit at the top of car and a substantial temporary door or gate on the front of the elevator entrance.

E. ELECTRICAL INSTALLATION: The Contractor, no later than twenty (20) Days after the machine room roof slab or that portion of it surrounding the elevator has been placed, must furnish and install temporary or permanent power and light feeders as required for the elevator used for temporary service. Additionally, the Contractor must connect such feeders to the terminals on the starter panels or controllers in the machine room to the low voltage transformers and car light outlets in the center of the shaft way and for the car control and signal traveling cables. The Contractor must make all these required connections as soon as the equipment is declared ready for such connections by the Resident Engineer.

F. REMOVAL: As directed by the Commissioner and when elevators for permanent use have been installed and are in proper condition for service, the Contractor must remove the temporary enclosures and all temporary elevator equipment and promptly proceed with the installation of the permanent equipment as required under the Contract.

G. INSPECTION: Before temporary elevator equipment is removed, a joint inspection of the equipment must be made by the Contractor and the Commissioner to determine the condition of this equipment upon the discontinuation of its temporary use. If this inspection deems it necessary, the Contractor must furnish and install new governor and compensating ropes, traveling cables, controller parts, etc. The car and counterweight safeties must be thoroughly cleaned of all dirt and all foreign matter, then properly lubricated and placed in good operating condition to the satisfaction of the Commissioner. If it is determined and ordered by the Commissioner that new hoist ropes are required, such ropes must be installed and payment will be made in accordance with Article 26 of the Contract.

H. REPLACEMENT: The Contractor must furnish and install new equipment or parts for any equipment or parts of the temporary elevator installation that have been damaged, destroyed, or that indicate excessive wear or corrosion, except for the replacement of hoisting ropes. All shaft ways, pits, motor rooms and sheave spaces used for temporary operation of elevators must be thoroughly cleaned. Where lubricated rails are used they must be washed down. If roller guides are used, all rust, dirt, etc., must be moved from the rails. The full cost of parts replacement, cleaning, etc., must be borne by the Contractor except for the replacement of hoisting ropes.

I. LIMITATIONS ON USE: The temporary elevator must not be used during its operation for the hoisting of materials or the removal of rubbish, but must be limited only to the transportation of employees of the Contractor and/or its Subcontractors, representatives of DDC, and other governmental agencies having jurisdiction of work at the Project. However, the Resident Engineer may grant special permission at specified times to the Contractor and/or its Subcontractors to hoist materials, which in the Resident Engineer's opinion will not overload or damage the elevator installation. In the event of any damage to the temporary elevator, the Contractor must notify the Resident Engineer within twenty-four (24) hours after such damage has occurred. As indicated above, the Contractor must be responsible for the replacement of any equipment or parts of the temporary elevator that have been damaged.

J. LIQUIDATED DAMAGES: The Contractor will be charged at the rate of one hundred dollars ($100) per Day for each Day it fails to provide the temporary elevator service described in this section beginning with the forty-first (41st) Day after the machine room roof slab, or that portion of it surrounding the elevator shaft, has been placed and stripped. This charge will be deducted from any amount due and owing to the Contractor.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.2

3.2 TEMPORARY USE, OPERATION AND MAINTENANCE OF ELEVATORS DURING CONSTRUCTION FOR NEW BUILDING OVER FIFTEEN (15) STORIES:

A. INSTALLATION: The Contractor must install, complete, operate, and maintain in good working order, as indicated herein, two (2) selected main elevators for the transport of employees of the Contractor and/or its Subcontractors, representatives of DDC, and other governmental agencies having jurisdiction of work at the Project. The Contractor must furnish, install, and maintain such elevators in good working order, including all necessary hoisting ropes, governor cables, traveling conductor cables, operating devices, temporary hand reset target annunciators, temporary signal devices, and all other permanent or temporary parts. The installation, operation, and maintenance of the temporary elevators and all equipment and/or parts utilized in connection therewith must be in accordance with the rules and regulations of all agencies and/or entities having jurisdiction over elevators in temporary use. The two (2) elevators must not be operated simultaneously.

B. RESPONSIBILITY: The Contractor must be responsible for any injury to persons or damage to property arising out of the temporary elevators and all equipment and/or parts utilized in connection therewith.

C. COSTS: The Contractor must be responsible for all costs in connection with the temporary elevators, including without limitation:

1. Installing and operating the temporary elevators;

2. Maintaining the temporary elevators in clean, proper operating condition, including the cost of lubricants and/or parts for such maintenance;

3. Performing all Work in pits, shaft ways and machine rooms necessary for the operation of the temporary elevators;

4. Replacing the temporary elevators or any equipment or parts utilized in connection therewith, if required due to damage, destruction, or excessive wear or corrosion, except for the replacement of hoisting ropes as set forth below;

5. Performing all required electrical Work in connection with the temporary elevators;

6. Providing all electric power required to operate the temporary elevators;

7. Providing all necessary conduit and wiring connections for the proper operation and signaling of the temporary elevators; and

8. Providing all labor for the operation and maintenance of the temporary elevators, including on an overtime basis if necessary.

The total Contract price must include all costs in connection with the temporary elevators, including without limitation, the costs specified herein.

D. LOW RISE ELEVATOR: The Contractor must begin to provide temporary elevator service using one (1) selected main passenger elevator no later than six (6) weeks (thirty (30) Days) after the twelfth (12th) floor slab, or that portion of it surrounding the elevator shaft, has been placed and stripped. No later than one (1) week, (five (5) Days), after the twelfth (12th) floor slab, or that portion of it surrounding the elevator shaft, has been placed and stripped, the following Work must have been completed:

1. The shaft must be completely enclosed up to the twelfth (12th) floor by either the permanent or a temporary enclosure meeting the requirements of the law.

2. A temporary machine room enclosure must be provided at the eleventh (11th) floor and must be completely watertight either by permanent or temporary construction. Beams or other devices, either permanent or temporary, must be provided which will enable the safe and practicable hoisting of the elevator machinery for installation.

3. The Contractor must install on all floors up to and including the ninth (9th) floor at the shaft entrances to the elevator, solid substantial wood frames, either sliding or swing doors with substantial hardware and door locks, and any necessary approved wire mesh barricades for adjacent shaft ways.

4. The Contractor must furnish and install solid substantial enclosures at front, back, sides and top of car platform enclosure, with an emergency exit at top of car, except that the portion of the front at the elevator entrance must be provided with a substantial temporary door or gate.

E. ELECTRICAL INSTALLATION: The Contractor must, no later than ten (10) Days after the twelfth (12th) floor slab or that portion of it surrounding the elevator has been poured and stripped, furnish and install temporary or permanent power and light feeders as required for the elevator used for temporary service. The Contractor must connect such feeders to the terminals on the starter panels or controllers in the temporary machine room to the low voltage transformers, car light outlets in the center of the shaftway, and for the car control and signal traveling cables. The Contractor must make all these required connections as soon as the equipment is declared ready for such connections by the Resident Engineer.

F. HIGH RISE ELEVATOR: The Contractor must begin to provide temporary elevator service to all floors using a selected main passenger elevator no later than eight (8) weeks (forty (40) Days) after the machine room roof slab, or that portion of it surrounding the elevator shaft has been placed. No later than three (3) weeks (fifteen (15) Days) after the machine room roof slab, or that portion of it surrounding the elevator shaft has been placed, the following Work must have been completed:

1. The shaft must be completely enclosed by either the permanent or temporary enclosure, meeting the

requirements of the law.

2. The machine room must be completely watertight either by permanent or temporary construction. Beams or other devices, either permanent or temporary, must be provided to enable the safe and practicable hoisting of the elevator machinery for installation.

3. The Contractor must install on all floors at the shaft way entrances to the elevator solid substantial frames, either sliding or swing doors with substantial hardware and door locks, and any necessary approved wire mesh barricades for adjacent shaft ways.

4. The Contractor must furnish and install solid substantial enclosures at front, back, sides and top of car platform enclosure, with an emergency exit at top of car, except that the portion of the front at the elevator entrance must be provided with a substantial temporary door or gate.

G. ELECTRICAL INSTALLATION: The Contractor must, not later than twenty (20) Days after the machine room slab or that portion of it surrounding the elevator shaft has been placed, furnish and install temporary or permanent power and light feeders as required for the high-rise elevator to be used for temporary service. The Contractor must connect such feeders to the terminals on the motor-generator starter panels, or controllers in the machine room, to the signal circuits low voltage transformers for the annunciators and car light outlets in the center of shaft way. The Contractor must make all these required connections as soon as the equipment is declared ready for such connections by the Resident Engineer.

H. When the high-rise elevator is completed and ready for temporary operation, the low-rise temporary elevator must be shut down.

I. REMOVAL: When directed by the Commissioner and one (1) or more elevators for permanent use have been installed and are in condition for service, the Contractor must remove the temporary enclosures, all temporary elevator equipment, and promptly proceed with the installation of the permanent equipment as required under the Contract.

J. INSPECTION: Before temporary elevator equipment is removed, a joint inspection of the equipment must be made by the Contractor and the Commissioner to determine the condition of this equipment upon the discontinuation of its temporary use. If this inspection determines it necessary, the Contractor must furnish and install new governor and compensating ropes, new traveling cables, new controller parts, etc. The car and counterweight safeties must be thoroughly cleaned of all dirt and all foreign matter, then properly lubricated and placed in good operating condition to the satisfaction of the Commissioner. If it is determined and ordered by the Commissioner that new hoist ropes are required, such ropes must be installed and payment will be made in accordance with Article 26 of the Contract.

K. REPLACEMENT: The Contractor must furnish and install new equipment or parts for any equipment or parts of the temporary elevator installations that have been damaged, destroyed, or that indicate excessive wear or corrosion, except the replacement of hoisting ropes. All shaft ways, pits, motor rooms and sheaves spaces used for temporary operation of elevators must be thoroughly cleaned down. Where lubricated rails are used they must be washed down; if roller guides are used, all rust, dirt, etc., must be removed from the rails. The full cost of parts replacement cleaning, etc., must be borne by the Contractor except for the replacement of hoisting ropes.

L. LIMITATIONS ON USE: The temporary elevators must not be used during their operation for the hoisting of materials or the removal of rubbish, but must be limited only to the transportation of employees of the Contractor and/or its Subcontractors, representatives of DDC, and other governmental agencies having jurisdiction of Work at the Project. However, the Resident Engineer may grant special permission at specified times to the Contractor and/or its Subcontractors to hoist materials, which in the Resident Engineer's opinion will not overload or damage the elevator installation, but only after such times as all plastering has been completed from the second floor up. In the event of any damage to the temporary elevator, the Contractor must notify the Resident Engineer within twenty-four (24) hours after such damage has occurred. As indicated above, the Contractor must be responsible for the replacement of any equipment or parts of the temporary elevator that have been damaged.

M. LIQUIDATED DAMAGES: The Contractor will be charged at the rate of one hundred dollars ($100) per Day for each Day it fails to provide the temporary elevator service described in this Section beginning with the thirty-first (31st) Day after the twelfth (12th) floor slab, or that portion of the twelfth (12th) floor slab surrounding the elevator shaft, has been placed and stripped. This charge will be deducted from any amount due and owing to the Contractor.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3

3.3 TEMPORARY USE, OPERATION AND MAINTENANCE OF ELEVATORS DURING CONSTRUCTION FOR EXISTING BUILDINGS:

A. The Contractor may use, at the Commissioner's discretion, one (1) selected elevator in the building for temporary operation by the Contractor for the transportation of employees of the Contractor and/or its Subcontractors, representatives of DDC, and other governmental agencies having jurisdiction over the Work at the Project. The operation of the temporary elevator and all equipment and/or parts utilized in connection therewith must be in accordance with the rules and regulations of all agencies and/or entities having jurisdiction over elevators in temporary use.

B. RESPONSIBILITY: The Contractor must be responsible for any injury to persons or damage to property arising out of the temporary elevator and all equipment and/or parts utilized in connection therewith.

C. REPLACEMENT: The Contractor must furnish and install new equipment or parts for any equipment or parts of the elevator for temporary operation that have been damaged, destroyed, or that indicate excessive wear or corrosion, except the replacement of hoisting ropes. All shaft ways, pits, motor rooms and sheave spaces used for temporary operation of elevators must be thoroughly cleaned down. Where lubricated rails are used they must be washed down, if roller guides are used, all rust, dirt, etc., must be moved from the rails. The full cost of parts replacement, cleaning, etc., must be borne by the Contractor except for the replacement of hoisting ropes. If it is determined and ordered by the Commissioner that new hoist ropes are required, such ropes must be installed and payment will be made in accordance with Article 26 of the Contract.

D. LIMITATIONS ON USE: The temporary elevator must not be used during its operation for the hoisting of materials or the removal of rubbish, but must be limited only to the transportation of employees of the Contractor and/or its Subcontractors, representatives of DDC, and other governmental agencies having jurisdiction of Work at the Project. However, the Resident Engineer may grant special permission at specified times to the Contractor and/or its Subcontractors to hoist materials, which in the Resident Engineer's opinion will not overload or damage the elevator installation. In the event of any damage to the temporary elevator, the Contractor must notify the Resident Engineer within twenty-four (24) hours after such damage has occurred. As indicated above, the Contractor must be responsible for the replacement of any equipment or parts of the temporary elevator that have been damaged.

E. LIQUIDATED DAMAGES: The Contractor will be charged at the rate of one hundred dollars ($100) per Day for each Day it fails to provide elevator services described in this section beginning with fifteen (15) Days from Notice to Proceed (NTP). This charge will be deducted from any amount due and owing to the Contractor.

3.4 TEMPORARY HOISTS AND HOISTWAYS (FOR MATERIAL AND PERSONNEL):

A. RESPONSIBILITY: The Contractor must provide adequate numbers of material hoists for the most expeditious performance of all parts of the Work including the Work of all its Subcontractors.

B. LOCATIONS: No hoists must be constructed at such locations as to interfere with, or affect the construction of, floor arches or the Work of Subcontractors. The hoists may be located at the exterior sides of the structure or in the courtyard and extend upward adjacent to the line of window openings. The hoists must be located a sufficient distance from the exterior walls and be so protected as to prevent any of the permanent Work from being damaged, stained or marred.

C. ELEVATOR SHAFT: Wherever possible, one or more of the permanent elevator shafts may be used as temporary hoistways, providing such use complies with the requirements of the Building Code of the City of New York, has been approved by the Commissioner, and does not interfere with the progress of the Work.

D. PROTECTION FOR INTERIOR HOISTS: All interior material hoistways must be enclosed on each floor and must be adequately protected with appropriate safety guards. In no event must the protection be less than that required by law.

END OF SECTION 01 54 11

SECTION 01 54 23
TEMPORARY SCAFFOLDING AND PLATFORMS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. Section 01 35 26 SAFETY REQUIREMENTS PROCEDURES.

C. The Contractor must comply with the requirements of "*The City of New York Department of Design and Construction Safety Requirements".* This document is included in the Information for Bidders.

1.2 SUMMARY:

A. This Section includes administrative and general procedural requirements for Temporary Scaffolding and Platforms, including:

1. Conformance
2. Responsibility
3. Jobsite Documentation and Submittals
4. Inspections

B. This Section governs ALL scaffold used on DDC Project site(s), including but not limited to, Suspended Scaffold, Supported Scaffold, and Sidewalk Sheds.

1.3 CONFORMANCE:

A. Unless otherwise indicated, the Contractor is responsible for providing, erecting, installing, and maintaining all temporary scaffolding and platforms which must comply with requirements of Chapter 33 (Safeguards During Construction or Demolition) of the New York City (NYC) Building Code, NYC Local Law 52 of 2005, OSHA Construction Standard 1926 Subpart L, and furnishing the items and personnel set forth in this Section.

1.4 RESPONSIBILITY:

A. Jobsite Safety Coordinator: The Contractor must designate and employ a Jobsite Safety Coordinator, who must be a competent person, who must have a daily presence on the Project site during scaffold use. This designee must possess and maintain a valid New York City Department of Buildings (DOB) supported scaffold certificate of completion. An alternate must also be designated in the event that the Jobsite Safety Coordinator is absent. The Jobsite Safety Coordinator must:

1. Verify completeness of documentation and submittals (as described below);
2. Verify that inspections are performed, including pull tests (see below), reports are filed and reported deficiencies are corrected;
3. Monitor trades using scaffold;
4. Limit access to scaffold areas that are tagged for non-use;
5. Inform trades of scaffold load limitations;
6. Monitor loading of decks;
7. Verify that any ties that are temporarily removed are properly restored in the same shift;
8. Verify that outriggers and planks that are moved are properly set up and secured;
9. Verify that all scaffold decks in use have proper access/egress;
10. Verify that all open sides of decks in excess of 14 inches have proper guardrails and toe-boards;

11. Notify appropriate parties, including but not limited to the Resident Engineer, Site Safety Coordinator / Monitor, Site Safety consultant, scaffold users, Contractor and the Scaffold Engineer, of misuses, non-conformances, hazards and accidents; and,
12. Keep a log of significant actions and events connected with the scaffolding.

B. The Contractor will be responsible for erecting, maintaining, and dismantling the scaffolding and/or sidewalk shed in conformance with requirements of the NYC Building Code, OSHA and the Contract Documents, including the Specifications. The Contractor must also be guided by generally accepted standards of scaffold industry practice as promulgated by the Scaffold Industry Association.

C. The Contractor must require the Subcontractor responsible for erecting the scaffolding to engage a Scaffold Engineer, licensed as a professional engineer by the State of New York. The Scaffold Engineer will be responsible to ensure the following: (1) that the installation design is in compliance with requirements of the NYC Building Code and OSHA, (2) that the design comports with the capabilities of the components and the characteristics of the site, (3) that scaffold loads on the host building, including netting, have been properly considered, and (4) that the design documents provide accurate information for erectors and users.

D. Scaffold users are trade contractors assigned to work on the scaffold. Training certificates from a DOB-approved training provider are mandatory. These users have a duty to become familiar with the NYC Building Code and OSHA requirements germane to users, to obey the instructions of the Jobsite Safety Coordinator, and to inform the Jobsite Safety Coordinator of known hazards, non-conformances, or violations.

1.5 JOBSITE DOCUMENTATION AND SUBMITTALS:

A. The Contractor must prepare, obtain, and submit the following to the Commissioner:

1. NYC DOB permit(s) for scaffold and sidewalk sheds (as applicable) including filing applications signed and sealed by a Professional Engineer licensed in the State of New York;
2. Site logistics plan / site safety plan;
3. Installation drawing(s), design, and product data to be provided for **all** scaffold(s) and shed(s) must include, at a minimum:
   a. Plan(s);
   b. Elevation(s);
   c. Duty load designation: “standard” (150 psf live load) or “heavy duty” (300 psf live load);
   d. Details including base support, anchors and ties;
   e. Notes and specifications including load limits, number of planked levels, tie spacing, netting, and sequence of installation and removal;
   f. Anchorage into sound material;
   g. Load limits based on pull tests;
   h. Specifications for pull test(s), method, proof load and the number of trials;
   i. Elevations, levels or heights, where anchorage is made into masonry;
   j. Specifications for frames, planks, screw jacks, anchors, and any other ancillary hardware;
   k. Samples for anchors, ties and netting;
   l. Sequence of operations for erection and demolition;
   m. Location plan, heights, widths, “jumps” over doorways and driveways;
   n. Specify size, maximum span and maximum spacing of headers and stringers;
   o. Specify legs, girts, braces, nailing and connections; and,
   p. All sidewalk sheds must be designed, engineered, signed, and sealed by a Professional Engineer licensed in the State of New York.
      i. Generic (not job-specific) engineering drawings are satisfactory for standard sheds and arrangements.

ii. Special engineering is required for custom sheds, site-specific problems or non-standard arrangements.

1.6 INSPECTIONS:

A. Signed inspection reports must be issued for each inspection and pull-test below, and must be logged and maintained on site by the Jobsite Safety Coordinator for the duration of the Project.

B. Pull testing will be required during design, and during or post erection, where anchorage is made into masonry. The Scaffold Engineer must specify the test method, proof load, and the number of trials.

C. Sidewalk sheds must be inspected after initial installation, major modification, or damage and thence every three months. Inspections must be by a Scaffold Engineer for custom sheds and by a Competent Person employed by the Contractor for standard sheds.

D. Scaffolds must be inspected by the Scaffold Engineer during erection, post-erection, and prior to use and thence every three (3) months. The Scaffold Engineer must repeat inspections after major alteration/ modification, and/or damage.

E. A Qualified Person assigned by the Contractor must inspect: the progress of erection and dismantling; and, the condition and integrity of the sidewalk sheds after high winds, major storms, and at least once per month during usage.

F. A Qualified Person assigned by the Contractor must inspect: the progress of erection and dismantling at least weekly; and, the condition and integrity of the scaffold after high winds, major storms, and at least once per month during usage.

G. Scaffolds and Sidewalk Sheds must be inspected daily by the Jobsite Safety Coordinator or alternate, prior to use by scaffold users. The inspection results must be recorded in the maintenance log and must always be available on-site.

H. At the completion of the Project, submit all inspection documents as Miscellaneous Record Documents in accordance with SECTION 01 78 39 CONTRACT RECORD DOCUMENTS.

1.7 LADDERS AND STAIRS:

A. The Contractor must provide and maintain ladders or temporary stairs extending from the street to the first story, and to and from every floor and roof level of the Project.

1.8 ACCESS AND EXITS:

A. The ladders or temporary stairs must be of acceptable size, number and location, so that proper and convenient access may be had by those required to proceed to and from all parts of the Project.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.9

1.9 PAYMENT FOR SIDEWALK SHEDS:

A. Payment for sidewalk sheds will be made on a unit price basis.

B. The quantity to be measured for payment under this item will be the number of months (to the nearest 1/4 month increment) that the Contractor satisfactorily provides for sidewalk sheds in accordance with these specifications.

C. The unit price bid per month for sidewalk sheds must include the cost of furnishing all labor, materials, plant, equipment, insurance and incidentals required to provide sidewalk sheds, all in accordance with the Contract Drawings, these specifications, and the directions of the Commissioner.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 54 23

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART I – GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.3 RELATED SECTIONS:

A. Section 01 42 00 REFERENCES for applicable industry standards for products specified.

1.4 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved by Commissioner through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. In addition to the basis-of-design product description, product attributes and characteristics are listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.

C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure.

1.5 ACTION SUBMITTALS

A. Product Specification Submittals: Comply with requirements in Section 01 33 00 SUBMITTAL PROCEDURES. Show compliance with requirements.

B. Comparable Product Request Submittal: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
2. Review Action: If necessary, Commissioner will request additional information or documentation for evaluation and will notify Contractor of approval or rejection of proposed comparable product request.

    a. Format of Approval of Submittal: Per Article 1.6 of Section 01 33 00 SUBMITTAL PROCEDURES.
    b. Use product specified, or products by Manufacturers specified if Commissioner does not issue a decision on use of a comparable product request.

1.6 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:

    a. Name of product and manufacturer.
    b. Model and serial number.
    c. Capacity.
    d. Speed.
    e. Ratings.

3. See individual identification sections in Divisions 21, 22, 23, and 26 for additional identification requirements.

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
5. Protect stored products from damage and liquids from freezing.

1.8 PRODUCT WARRANTIES

A. Warranties specified in other Sections will be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of Guaranty obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to the City of New York.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for the City of New York.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 01 77 00 CLOSEOUT PROCEDURES.

PART II – PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Descriptive, performance, and reference standard requirements in the Specifications establish required characteristics of products.
2. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
3. Commissioner will review and approve products with warranties meeting the requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Commissioner will make selection.

B. Or Approved Equal:

1. Comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product, or for use of a product by an unnamed Manufacturer, as designated by the term "Or approved equal".

2. Submit additional documentation required by Commissioner, in order to establish equivalency of proposed products. Evaluation of "Or approved equal" product status is by the Commissioner, whose determination is final.

C. Product Selection Procedures:

1. Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products will be considered. Comply with requirements in "Comparable Products" Article for consideration of a product by an unnamed manufacturer. Products' listing is indicated by the following:

   a. Products: Subject to compliance with requirements, provide one of the following:

      1) Manufacturer; Product designation
      2) Manufacturer; Product designation
      3) Manufacturer; Product designation
      4) Or approved equal

2. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed. Comparable products from unnamed Manufacturers will be considered. Comply with requirements in "Comparable Products" Article for consideration of a product by an unnamed manufacturer. Manufacturer's listing is indicated by the following:

   a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

      1) Manufacturer
      2) Manufacturer
      3) Manufacturer
      4) Or approved equal

3. Basis-of-Design Product: Where Specifications name a basis-of-design product, provide the specified product, or a comparable product by one of the other named manufacturers. Drawings may indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Specifications indicate performance requirements and physical properties, durability and other special and required features that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers. Basis-of-Design Product listing is indicated by the following:

   a. Subject to compliance with requirements, provide [product indicated on Drawings] [manufacturer's name; product name or designation] or comparable product by one of the following:

      1) Manufacturer
      2) Manufacturer
      3) Or approved equal

4. Sole Source Product (Single Proprietary): Where Specifications name a single manufacturer and product, provide the named product. A Sole Source Product selection requires prior request by the Design Consultant and approval by the Commissioner for its inclusion in specifications. Sole Source Product is indicated by the following phrase listing:

   a. Sole Source Product: Manufacturer's name and Product designation.

      1) No substitutions Permitted.

D. Visual Matching Specification: Where Specifications require "match Commissioner's sample," provide a product that complies with requirements and matches Commissioner's sample. Commissioner's decision will be final on whether a proposed product matches.

E. Visual Selection Specification: Where Specifications include the phrase "as selected by Commissioner from manufacturer's full range" or similar phrase, select a product that complies with requirements. Commissioner will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration of Comparable Products (Or Approved Equal): Commissioner will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Commissioner may return requests without action, except to record noncompliance with these requirements:

B. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant product qualities include attributes such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.

C. Evidence that proposed product provides specified warranty.

D. List of similar installations for completed projects with project names and addresses and names and addresses of architects and Owners, if requested.

E. Samples, if requested.

F. Submittal Requirements: Approval by the Commissioner of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements.

G. Comply with all other specified product and submittal requirements.

PART III – EXECUTION (Not Used)

END OF SECTION 01 60 00

SECTION 01 73 00
EXECUTION

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes general procedural requirements governing execution of the Work including without limitation the following:

1. Delivery of Materials
2. Contractor's Superintendent
3. Surveys
4. Borings
5. Examination
6. Environmental Assessment
7. Preparation
8. Deferred Construction
9. Installation
10. Permits
11. Transportation
12. Sleeves and Hangers
13. Sleeve and Hanger Drawings
14. Cutting and Patching
15. Location of Partitions
16. Furniture and Equipment
17. Removal of Rubbish and Surplus Material
18. Cleaning
19. Security and Protection of Work Site
20. Maintenance of Site and Adjoining Property
21. Maintenance of Project Site
22. Safety Precautions for Control Circuits
23. Obstructions in Drainage Lines
24. Correction of the Work

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION
C. Section 01 33 00 SUBMITTAL PROCEDURES
D. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT & DISPOSAL
E. Section 01 77 00 CLOSEOUT PROCEDURES
F. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Term	Definition
Design Consultant	The entity responsible for providing design services for the Project, including, without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.5 QUALITY ASSURANCE:

A. Land Surveyor Qualifications: A professional land surveyor who is licensed in the State of New York and who is experienced in providing land-surveying services of the kind indicated.

PART II - PRODUCTS (Not Used)

PART III - EXECUTION

3.1 DELIVERY OF MATERIALS:

A. Material Orders: The Contractor must furnish to the Commissioner a copy of each material order, indicating date of order and quantity of material, and must also notify the Commissioner when materials have been delivered to the Site and in what quantities.

B. Ample Quantities: The Contractor must deliver materials in ample quantities to ensure the most prompt and uninterrupted progress of the Work so as to complete the Work within the Contract time.

C. Containers: The manufacturer's containers must be delivered with unbroken seals and must bear proper labels.

D. Deliveries: The Contractor must coordinate deliveries in order to avoid delaying or impeding the progress of the Work.

E. Handling: The Contractor must provide equipment and personnel to handle products by methods to prevent soiling or damage.

1. Promptly inspect shipments to assure products comply with requirements, quantities are correct, and products are undamaged.
2. Promptly return damaged shipments or incorrect orders to manufacturer.
3. For materials or equipment to be reused or salvaged, use special care in removal, storage and reinstallation to insure proper function in completed Work.

F. Storage: Store products in accordance with provisions of Article 3.1 of the Standard Construction Contract, and periodically inspect to assure that stored products are undamaged and are maintained under required conditions.

G. Stacking: All materials must be properly stacked in convenient places adjacent to the Site, or where directed, and protected in a satisfactory manner. Stacked materials must be arranged so as to not interfere with visibility of traffic control devices.

H. Overloading: If the Commissioner permits the storage of materials in any part of the Project area, they must be so stored as to cause no overloading.

I. No Interference: If it becomes necessary to remove and restack materials to avoid impeding the progress of any part of the Work or interfering with the Work to be done by any trade Subcontractor, the Contractor must remove and restack such materials at no additional cost to the City.

3.2 CONTRACTOR'S CONSTRUCTION SUPERINTENDENT:

A. Contractor's Construction Superintendent: The Contractor must devote its time and personal attention to the Work and must employ and retain at the Project Site, from commencement until Final Acceptance, a Contractor's Construction Superintendent. The Contractor's Construction Superintendent must be registered with the New York City Department of Buildings (DOB) in compliance with the Construction Superintendent Rule of the City of New York, be competent and capable of maintaining proper supervision and care of the Work, and be acceptable to the Commissioner. The Construction Superintendent, in the absence of the Contractor, and irrespective of any superintendent or foreman employed by any Subcontractor, must see that the instructions of the Commissioner are carried out.

B. Replacement: The Contractor's Construction Superintendent on the job must not be changed or removed without the consent of the Commissioner.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.3

3.3 SURVEYS:

A. Line and Grade: The City will establish a baseline and bench mark near the Site of the Work for use by the Contractor in connection with the performance of the Work.

B. Responsibility: The Contractor must establish all other lines and elevations required for the Work and must be solely responsible for the accuracy thereof.

C. Safeguard All Points: The Contractor must safeguard all points, stakes, grade marks and bench marks made or established by the Contractor on the Work. The Contractor must re-establish same if disturbed, and bear the entire expense of rectifying the Work if improperly installed due to not maintaining, protecting or removing without authorization from the Commissioner such established points, stakes, or marks.

D. City Monuments and Markers: No Work must be performed near City monuments or markers so as to disturb them until the said monuments or markers have been referenced or reset or otherwise disposed of by the relevant Agency or party who installed them.

E. Foundations: The Contractor must furnish certification from a licensed Surveyor that all portions of the foundation Work are located in accordance with the Contract Drawings and at the elevations required thereby. This certification must show the actual locations and the actual elevations of all the Work in relation to the locations and elevations shown on the Contract Drawings, including, but not restricted to the following:

1. The locations and elevations of all piles, if any.
2. Elevations of tops of all spread footings, tops of pile caps, and tops of all foundation walls, elevator pit walls and ramp walls.
3. Location of all footing centers and pier centers including those for exterior wall columns.
4. Location of all foundation walls including wall columns, elevator pit walls and ramp walls.

F. Wall Lines: After the first courses of masonry or stone have been laid, the Contractor must establish the permanent lines of exterior walls. The Contractor must promptly furnish certification from a licensed Surveyor in the form of signed original drawings showing the exact location of such wall lines of all portions

of all structures. Except at its own risk, the Contractor must not proceed further with the erection of walls until the Surveyor's certification has been submitted and verified for correct location of wall lines.

G. Surveyor: The Surveyor selected for any of the purposes mentioned in Paragraph E and Paragraph F above, and Paragraph I below, must be a land Surveyor licensed in the State of New York and must be subject to the approval of the Commissioner. The Surveyor must not be a regular employee of the Contractor, nor must the Surveyor have any interest in the Contract. The Surveyor's certification must represent an independent and disinterested verification of all layout. The Surveyor must report to the Department of Design and Construction's (DDC) Resident Engineer each time upon arrival to and departure from the Site and review with the Resident Engineer the data required for the Project.

H. Final Certification: Final certification must be submitted upon completion of the Work or upon completion of any subdivision of the Work as directed by the Commissioner. Any exceptions or deviations from the Contract Drawings must be noted on the final certificate and must include any maps, plates, notes, pertinent documents and data necessary, in the opinion of the Commissioner, to constitute a full and complete report.

I. Final Survey: The Contractor must submit to DDC for submission to DOB a final Survey by the licensed Surveyor showing the location of the new Work, before completion of the Work. This Survey must show the location of the first tier of beams or of the first floor; the finish grades of the open spaces on the plot; the established curb level and the location of all other Work on the plan, together with the location and boundaries of the lot or plot upon which the Work is constructed, curb cuts, all yard dimensions, etc.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.4

3.4 BORINGS:

A. The work of this article must be the responsibility of the Contractor unless otherwise indicated.

B. Reference Drawings: The boring drawings as listed on the title sheet are for information to the bidder and are to be used under the conditions as follows:

1. Boring logs: shown on the boring drawings, record information obtained under engineering supervision in the course of exploration carried out by or under the direction of DDC at the Site.

2. Soils and Rock Samples: All inferences are drawn from the indications observed as made by engineering and scientific personnel. All such inferences and all records of the Work, including soil samples and rock cores, if any, are available to bidders for inspection.

3. Certification of Samples: The City certifies that the Work was carried out as stated, and that the soil samples and rock cores were actually taken from the site at the times, places, and in the manner indicated on the boring drawings. The samples are available for inspection in DDC's Subsurface Exploration Unit.

4. Bidder's Responsibility: The bidder, however, is responsible for any conclusions to be drawn from the Work. If the bidder accepts those of the City, it must do so at its own risk. If the bidder prefers not to assume such risk, the bidder is under the obligation of employing its own experts to analyze the available information and must be responsible for any consequences of acting on their conclusions.

5. Continuity Not Guarantee: The City does not guarantee continuity of conditions shown at actual boring locations over the entire Site. Where possible, borings are located to avoid all obstructions and previous construction which can be found by inspection of the surface. The bidder is required to estimate the influence of such features from its own inspection of the Site.

3.5 EXAMINATION:

A. Existing Conditions: The existence and location of Site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning the Work, the Contractor must investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

1. Before construction, the Contractor must verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground utilities and other construction indicated as existing are not guaranteed. Before beginning Site Work, the Contractor must investigate and verify the existence and location of underground utilities and other construction affecting the Work.

1. Before construction, the Contractor must verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, water-service piping, and underground electrical services.
2. The Contractor must furnish location data for Work related to the Project that must be performed by public utilities serving the Project Site.

C. Acceptance of Conditions: Examine all existing substrates, areas, equipment, and conditions, with the Subcontractor responsible for purchase of equipment, installation or application, for compliance with requirements for installation tolerances, equipment compatibility, and other conditions affecting performance. The Contractor must record observations of these examinations:

1. Verify compatibility with and suitability of substrates and equipment, including compatibility with existing finishes, primers, electrical services, and mechanical equipment.
2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.

Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces, equipment, and conditions.

3.6 ENVIRONMENTAL ASSESSMENTS:

A. City Responsibilities: An Environmental Assessment and survey is performed by DDC and its findings are included in the Contract Documents. In accordance with the NYC Administrative Code Title 15 Chapter 1, an asbestos survey is required to be performed by an Asbestos Investigator certified by the NYC Department of Environmental Protection (DEP) to identify the presence of asbestos containing material (ACM) prior to any alteration, renovation, or demolition activity. The findings of such survey are required for the submission of approvals and permits issued by DOB. When the findings indicate that asbestos containing material is present and will be disturbed during the alteration, renovation, or demolition activity, then abatement design specifications will be incorporated into the Contract Documents. The Contractor must comply with all federal, state and local asbestos regulations affecting the work for this Contract.

B. Contractor Responsibility: The Contractor must comply with all federal, state and local environmental regulations, including without limitation, United States Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA) regulations, which require the Contractor to assess if lead-based paint will be disturbed during the Work in order to protect the Contractor's workers and the building occupants from migration of lead dust into the air. The Contractor must comply with all federal, state and local environmental waste disposal regulations which may be required during the Work. The Contractor is required to hire licensed abatement and disposal companies for the requisite Work.

3.7 PREPARATION:

A. Field Measurements: The Contractor must verify all dimensions and conditions on the Site so that all Work will properly join the existing conditions.

B. Before commencing the Work, the Contractor must examine all adjoining materials on which its Work is in any way dependent on good workmanship in accordance to the intent of the Specifications and the Contract Drawings. The Contractor must report to the Commissioner any condition that will prevent it from performing Work that conforms to the required Specifications.

C. Existing Utility Information: The Contractor must furnish information to the Commissioner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Additionally, the Contractor must coordinate with authorities having jurisdiction.

D. Space Requirements: The Contractor must verify space requirements and dimensions of items shown diagrammatically on the Contract Drawings.

3.8 DEFERRED CONSTRUCTION:

A. In order to permit the installation of any item or items of equipment required to be furnished and installed within the time allowed for completing the Work of the Contract, the Contractor must defer construction Work limited to adequate areas as approved and certified by the Commissioner.

B. The Contractor must confer with the affected trade Subcontractors and ascertain arrangements, time, and facilities necessary to be made by the Contractor in order to execute the provisions specified herein.

3.9 INSTALLATION:

A. General: The Contractor must locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical Work plumb and make horizontal Work level.

2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.

3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated on the Contract Drawings.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory-prepared and field-installed. Check shop drawings of other work and work of trade Subcontractors to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by the Design Consultant.

2. Allow for building movement, including thermal expansion and contraction.

3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral

anchors that are to be embedded in concrete or masonry. Deliver such items to Project Site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.10 PERMITS:

A. The Contractor must comply with all local, state and federal laws, rules, and regulations affecting the Work of this Project, including, without limitation, (1) obtaining all necessary permits for the performance of the Work prior to commencement thereof, and (2) complying with all requirements for the disposal of demolition and/or construction debris, waste, etc., including disposal in City landfills. The Contractor must be responsible for all costs in connection with such regulatory compliance, unless otherwise specified in the Contract.

3.11 TRANSPORTATION:

A. Availability: The Contractor must determine the availability of transportation facilities and dockage for the use of its employees, equipment, and materials, and the conditions under which such use will be permitted.

B. Costs: If transportation facilities and dockage are available and are permitted to be used by the governmental agency having jurisdiction, the Contractor must pay all necessary costs and expenses, and abide by all rules and regulations promulgated in connection therewith.

C. Vehicles: With respect to the use of vehicles on highways and bridges, the Contractor's attention is directed to the limitations set forth in the Rules of the City of New York, Title 34, Chapter 4, Section 4-15.

D. Continued Use: It is understood that the Commissioner makes no warranty as to the continued use by the Contractor of such facilities.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.12

3.12 SLEEVES AND HANGERS:

A. Coordinate with Progress Schedule: The Contractor must promptly furnish and install conduits, outlets, piping sleeves, boxes, inserts and all other materials and equipment that is to be built into the Work in conformity with the requirements of the Project.

B. Cooperation of Subcontractors: All Subcontractors must fully cooperate with each other in connection with the performance of the above Work as "cutting in" new work is neither contemplated nor will it be tolerated.

C. Timeliness: To avoid delay, in the event that timely delivery of sleeves and other materials cannot be made, the Contractor may arrange to have boxes or other forms set at the locations where the piping or other material is to pass through or into the slabs, walls or other Work. Upon the subsequent installation of the sleeves or other material, the Contractor must fill around them with materials as required by the Contract. The necessary expenditures incurred for the boxing out and filling in must be borne by the Contractor.

D. Inserts: The Contractor is to install strip inserts four (4) foot on center and perpendicular to beams in ceiling slabs of boiler, machine, and mechanical equipment rooms. Inserts are to be installed for strippable concrete slabs only.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.13

3.13 SLEEVE AND PENETRATION DRAWINGS:

A. As soon as practicable after the commencement of Work, and when the order in which concrete for the first slabs, walls, etc. to be poured is determined, the Contractor must submit to DDC a sketch indicating the location and size of all penetrations for sleeves, ducts, etc. which will be required to accommodate the mechanical trades in order to determine if such penetrations will materially weaken the Project's structure.

The sketch must be stamped and returned if approved and/or comments will be transmitted. The Contractor must continue to submit sketches as the pouring schedule and the concrete Work progresses and until approvals for the penetration sketches have been given. The Contractor must not predicate its layout Work on unapproved sketches.

3.14 CUTTING AND PATCHING:

A. Responsibility: The Contractor must do all cutting, patching, and restoration required by its Work, unless otherwise particularly specified in the Specifications.

B. Restore Work: The Contractor must restore any Work damaged during the performance of the Work.

C. Competent Workers: All restoration Work must be done to the satisfaction of the Commissioner by competent workers skilled in the trade required by such restoration. If, in the judgment of the Commissioner, workers engaged in restoration Work are incompetent, they must be replaced immediately by competent workers.

D. Structural Elements: Do not cut and patch structural elements without the prior approval, in writing, of the Commissioner.

E. Operational Elements: Do not cut and patch operating elements and related components.

F. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the Commissioner's opinion, reduce the building's aesthetic qualities. The Contractor must remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

G. Existing Warranties: The Contractor must remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

H. Removals: The Contractor must remove from the premises all demolished materials of every nature or description resulting from cutting, patching, and restoration work, in accordance with the requirements hereinafter stipulated under Sub-Section 3.17 herein and as further required in Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 3.15

3.15 LOCATION OF PARTITIONS:

A. Within three (3) weeks after the concrete slabs have been poured on each floor level, the Contractor must immediately locate accurately all of the partitions, including the door openings, on the floor slabs in a manner approved by the Commissioner.

3.16 FURNITURE AND EQUIPMENT:

A. Responsibility: The Contractor is responsible for moving all loose furniture and/or equipment in all areas where the location of such furniture and/or equipment interferes with the proper performance of its Work.

B. Protection: All such furniture and/or equipment must be adequately protected with dust cloths and returned to their original locations when directed to do so by the Commissioner.

3.17 REMOVAL OF RUBBISH AND SURPLUS MATERIALS:

A. Of the waste that is generated during demolition, as many of the waste materials as economically feasible must be reused, salvaged, or recycled. Waste disposal in landfills must be minimized. Comply with requirements of Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.

B. Rubbish: Rubbish must not be thrown from the windows or other parts of the Project. Mason's rubbish, dirt and other dust-producing material must be wetted down periodically.

C. Location: The Contractor must clean the Project Site and Work area daily, sweep up, and deposit at a location designated on each floor, all of its rubbish, debris, and waste materials as it accumulates or more frequently when directed by the Commissioner. Wood crating must be broken up, neatly bundled, tied, and stacked ready for removal and be deposited at a location designated on each floor.

1. Comply with requirements in NYC Fire Department for removal of combustible waste materials and debris.

2. Do not hold materials more than seven (7) Days during normal weather or three (3) Days if the temperature is expected to rise above 80 degrees F (27 degrees C).

3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

D. Laborers: Since the Contractor is responsible for the removal of all rubbish, etc., from the Site, the Contractor must employ and keep engaged for this purpose an adequate number of laborers.

E. Surplus Materials: The Contractor must remove from the Site all surplus materials when there is no further use for same.

F. Tools and Materials: At the conclusion of the Work, all erection plant, tools, temporary structures and materials belonging to the Contractor must be promptly removed.

G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

3.18 CLEANING:

A. The Contractor must thoroughly clean all equipment and materials furnished and installed, and must deliver such materials and equipment undamaged in a clean and new appearing condition up to date of Final Acceptance.

B. Site: Maintain Project Site free of waste materials and debris.

C. Installed Work: Keep installed Work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of the product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

D. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

E. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration up to date of Final Acceptance.

F. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration up to date of Final Acceptance.

3.19 SECURITY AND PROTECTION OF WORK SITE:

A. Provide protection of installed Work, including appropriate protective coverings, and maintain conditions that ensure installed Work is without damage or deterioration up to date of Final Acceptance.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

C. Secure and protect Work and Work Site against damage, loss, injury, theft and/or vandalism.

D. Maintain daily sign-in sheets of workers and visitors and make the sheets available to the Commissioner.

3.20 MAINTENANCE OF SITE AND ADJOINING PROPERTY:

A. The Contractor must take over and maintain the Project Site, after order to start Work.

B. The Contractor must be responsible for the safety of the adjoining property, including sidewalks, paving, fences, sewers, water, gas, electric and other mains, pipes and conduits etc. until the date of Final Acceptance. The Contractor must, at its own expense, except as otherwise specified, protect same and maintain them in at least as good a condition as that in which the Contractor finds them.

C. All pavements, sidewalks, roads and approaches to fire hydrants must be kept clear at all times, maintained and repaired to serviceable condition with materials to match existing.

D. Provide and keep in good repair all bridging and decking necessary to maintain vehicular and pedestrian traffic.

E. The Contractor must also remove all snow and ice as it accumulates on the sidewalks within the Contract Limits Lines.

3.21 MAINTENANCE OF PROJECT SITE:

A. The Contractor must take over and maintain all Project areas, after order to start Work.

B. Until the date of Final Acceptance, the Contractor must be responsible for the safety of all Project areas, including water, gas, electric and other mains and pipes and conduits and must, at the Contractor's own expense, except as otherwise specified, protect same and maintain them in at least as good condition as that in which the Contractor finds them.

C. All pavements, sidewalks, roads and approaches to fire hydrants must be kept clear at all times, maintained, and if damaged, repaired to serviceable conditions with materials to match existing.

D. The Contractor must keep the space for the Resident Engineer in a clean condition.

3.22 SAFETY PRECAUTIONS FOR CONTROL CIRCUITS:

A. Control circuits, the failure of which will cause a hazard to life and property, must comply with DOB Bureau of Electrical Control requirements.

3.23 OBSTRUCTIONS IN DRAINAGE LINES:

A. The Contractor must be responsible for all obstructions occurring in all drainage lines, fittings, and fixtures after the installations and cleaning of these drainage lines, fittings, and fixtures, as certified by the Resident Engineer. Roof drains must be kept clear of any and all debris. Any stoppage must be repaired immediately at the expense of the Contractor.

3.24 CORRECTION OF THE WORK

A. Subject to the terms of the Contract, the Contractor must complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Contractor must repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.

2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
   a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 01 73 00

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes administrative and procedural requirements for the management and disposal ofconstruction waste and includes the following requirements:
   1. Waste Management Goals
   2. Waste Management Plan
   3. Progress Reports
   4. Progress Meetings
   5. Management Plan Implementation

B. This section includes:
   1. Definitions
   2. Waste Management Performance Requirements
   3. Reference Resources
   4. Submittals
   5. Quality Assurance
   6. Waste Plan Implementation
   7. Additional Demolition and Salvage Requirements
   8. Disposal

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION
C. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
D. Section 01 73 00 EXECUTION
E. Section 01 77 00 CLOSEOUT PROCEDURES
F. Section 01 78 39 CONTRACT RECORD DOCUMENTS
G. Refer to the Addendum to identify whether this Project is designed to comply with a Certification Level according to the U.S. Green Building Council's LEED Rating System, as specified in Section 01 81 13.03"SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS" or Section 01 81 13.04 "SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS".

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the GeneralConditions not otherwise defined herein.

Term	**Definition**
Alternative Daily Cover (ADC)	Material other than earthen material placed on the surface of the active face of a municipal solid Waste landfill at the end of each Work Day to control vectors, fires, odors, blowing litter and scavenging.
Design Consultant	The entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the Design Consultant may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.
Clean	Untreated and unpainted; not contaminated with oils, solvents, caulk or the like.
Construction and Demolition (C&D) Waste	Solid Wastes typically including building materials, trash debris and rubble resulting from remodeling, repair and demolition operations. Hazardous materials and land clearing Waste are not included.
Diversion from Landfill	Material removal from the Site for Recycling, Reuse or Salvage that might otherwise be sent to a landfill.
Off-site Sorting	Material types that are combined on the project site and hauled away for sorting. Measured weights only. Approximations of weight or volume based on visual inspection are not acceptable. a. Off-site Sorting Method 1: Diversion Rate derived from the weight of the individual diverted material type divided by the weight of the commingled waste. Individual diverted material types handled through this sorting method are each counted as an individual diverted material type. b. Off-site Sorting Method 2: Diversion Rate derived from the waste sorting facility average diversion rate, multiplied by the weight of the commingled waste. All diverted materials handled through this sorting method are counted as a single diverted material type.
On-site Sorting	Material types that have been sorted in segregated containers or project areas for removal as segregated diverted material types. Measured weights only. Approximations of weight or volume based on visual inspection are not acceptable. a. On-site Sorting: Diversion Rate derived from the weight of the diverted material type. Material diverted through this sorting method are each counted as an individual diverted material type.
Recyclable	The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product.
Recycle (recycling)	To sort, separate, process, treat or reconstitute solid Waste and other discarded materials for the purpose of redirecting such materials into the manufacture of useful products. Recycling does not include burning, incinerating or thermally destroying Waste.
Return	To give back Reusable items or unused products to vendors.

Reuse	To reuse excess or discarded construction material in some manner on the Project Site.
Salvage	To remove a Waste material from the Project Site for resale or reuse.
Waste	Extra material or material that has reached the end of its useful life in its intended use. Waste includes Salvageable, Returnable, Recyclable and Reusable material.
Waste Management Plan	A Project-related plan for the collection, transportation and disposal of Waste generated at the construction Site. The purpose of the plan is to ultimately reduce the amount of material becoming landfill.
Waste-to-Energy	The conversion of non-Recyclable Waste materials into usable heat, electricity or fuel through a variety of processes, including combustion, gasification, pyrolization, anaerobic digestion and landfill gas recovery.

1.5 WASTE MANAGEMENT PERFORMANCE REQUIREMENTS:

A. The City of New York has established that this Project must generate the least amount of Waste possible and employ processes that ensure the generation of as little Waste as possible due to error, inaccurate planning, breakage, mishandling, contamination, or other factors.

B. Of the Waste that is generated during demolition, as many of the Waste materials as economically feasible, and as stated here, must be Reused, Salvaged, or Recycled. Waste disposal in landfills must be minimized.

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SUB-SECTION 1.5 C

C. LEED CERTIFICATION: The City of New York will seek Leadership in Energy and Environmental Design (LEED) certification for this Project as indicated in the Addendum to the General Conditions from the U.S. Green Building Council. The documentation required here will be used for this purpose. LEED awards points for a variety of sustainable design measures on a project, one of which is the Reuse and Recycling of project Waste.

D. DIVERSION REQUIREMENTS. With the exception of LEED v4 projects with demolition ADC Waste, a minimum of seventy-five percent (75%) of total Project demolition and construction Waste (by weight) must be diverted from landfill through at least four (4) diverted material types. LEED v4 projects with demolition ADC Waste must divert a minimum of fifty percent (50%) of total Project demolition and construction Waste (by weight) from landfill through at least three (3) diverted material types. The following Waste categories are likely candidates to be included in the diversion plan as applicable for this Project:

1. Concrete;
2. Bricks;
3. Concrete masonry units (CMU);
4. Asphalt;
5. Metals (e.g. banding, stud trim, ceiling grid, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized, stainless steel, aluminum, copper, zinc, brass, bronze);
6. Clean dimensional wood;

7. Carpet and pad;
8. Drywall;
9. Ceiling tiles;
10. Cardboard, paper and packaging; and
11. Reuse items indicated on the Contract Drawings and/or elsewhere in the Specification.

E. All fluorescent lamps, High Intensity Discharge lamps and mercury-containing thermostats removed from the Site must be Recycled. Do not use bulb crusher on Site.

F. Recycling on the job, subject to the Commissioner's approval, is encouraged on the Site itself, such as the crushing and reuse of removed sound concrete and stone. Include these categories in the Waste Management Plan.

G. Land-clearing debris is not considered construction, demolition or renovation Waste and is not to be included as contribution to Waste diversion.

H. A minimum of five (5) material types, both structural and nonstructural, are to be identified in the Construction Waste Management Plan for diversion.

I. For LEED v4 projects, material to be used as ADC does not qualify as material diverted from disposal.

1.6 REFERENCES, RESOURCES:

A. DDC encourages its Contractors to seek information from websites and experts in Salvage or Recycling inorder to minimize disposal costs. There are numerous opportunities to sell, Salvage, or to donate materials and accrue tax benefits (which would accrue to the Contractor responsible for removal); there are also outlets that will pick up, and in some cases, buy Recyclable materials. Examples of information resources are as follows:

1. A standard Construction and Demolition (C&D) Waste Management Log form is available through DDC's Sustainable Design website: https://www1.nyc.gov/assets/ddc/downloads/Sustainable/forms-local-law-86/waste-tracking-form.pdf.
2. Web Resources (information only; no warranty or endorsement is implied):
   a. www1.nyc.gov/assets/donate/site/ – Website of donateNYC, a network of nonprofit organizations in New York City that accept and distribute second-hand and surplus goods.
   b. www.bignyc.org – Website of Build It Green NYC, a non-profit outlet for Salvaged and surplus building materials.
   c. www.usgbc.org – Website of the United States Green Building Council, with a description of the LEED certification process and requirements for C&D Waste Recycling.
   d. www.epa.gov/smm/sustainable-management-construction-and-demolition-materials– Website of the U.S. Environmental ProtectionAgency (EPA) that discusses C&D Waste issues, and links to other resources.
3. Waste-to-Energy Facilities that need to comply with European Standard (EN) for Waste management and emissions into air, soil, surface water and groundwater:
   a. www.ec.europa.eu/environment/waste/framework/index.htm – European Commission Waste Framework Directive 2008/98/EC.
   b. https://eur-lex.europa.eu/homepage.html - European Commission Waste

Incineration Directive 2000/76/EC.

c. www.cen.eu/cen/Products – EN Standards 303-1, 303-2, 303-3, 303-4, 303-5, 303-6, 303-7.

1.7 SUBMITTALS:

A. The Contractor must refer to Section 01 33 00 SUBMITTAL PROCEDURES for submittal requirements.

B. The Contractor must be responsible for the development and implementation of a Waste Management Plan for the Project. The Contractor's Subcontractors must assist in the development of that Plan, and collect and deposit their Waste and Recyclable materials in accordance with the approved Plan.

C. Draft Waste Management Plan: Within fifteen (15) Days after receipt of the Notice to Proceed (NTP), or prior to any Waste removal, whichever occurs sooner, the Contractor must submit to the Commissioner a Draft Waste Management Plan. Include separate sections for C&D Waste. The Plan must demonstrate how the performance goals will be met, and contain the following:

1. List of material types targeted for Reuse, Salvage, or Recycling, and names, addresses, and phone numbers of receiving facilities/companies that will be purchasing or accepting each material. Each material listed is to include estimated amount in tons and percentage of overall construction waste of each of the material steams.
2. Estimation of the percentage of overall construction waste that will be sent to landfill.
3. Description of on-Site and/or off-Site sorting methods for all materials to be removed from Site. Off-site sorting methods must be categorized as Off-site Sorting Method 1 or Off-site Sorting Method 2.
4. If mixed C&D Waste is to be sorted off-Site, provide a letter from the processor stating the average percentage of mixed C&D Waste they Recycle. Waste processor's average percentage of mixed C&D waste must not include Alternative Daily Cover as a recycled material for LEED v4 projects.
5. Landfill information: Names of landfills where non-Recyclable/reusable/salvageable Waste will be disposed, and list of applicable tipping fees.
6. Material handling procedures: Specify whether materials must be separated or commingled and describe the planned diversion strategies. Describe expected amount of each material type, where materials must be taken and how the Recycling facility must process the material. Provide a description of the means by which any Recyclable, Salvaged, or Reused materials will be protected from contamination and collected in a manner that will meet the requirements for acceptance by the designated Recycling processors.
7. Transportation: A description of the means of transportation and destination for Recycled materials.
8. Meetings: Regular meetings must be held monthly, or as directed by the Commissioner, and the Contractor must provide a description of these meetings to address Waste management.
9. Sample spreadsheet and description of how the implementation of the Plan will be documented and submitted on a monthly basis.

D. Final Waste Management Plan: Within fifteen (15) Days of Commissioner's approval of the Draft Waste Management Plan, the Contractor must submit a Final Waste Management Plan.

E. Progress Reports: The Contractor must submit a monthly Waste Management Progress Report, containing the following information:

1. Project title, name of company completing report, and dates of period covered by the report.
2. Report on the disposal of all Project Site Waste. A DDC C&D Waste Management Log form is included at the end of this section. For each shipment of material removed from the Site, provide the following:
   a. Date and ticket number of removal;
   b. Identity of material hauler;
   c. Material type;
   d. Waste sorting method;
   e. Total quantity of Waste, in tons/cubic yards, by type;
   f. Quantity of Waste Salvaged, Recycled and/or Reused, by type;
   g. Total quantity of Waste diverted from landfill (Recycled, Salvaged, Reused) as a percentage of total Waste; and
   h. Recipient of each material type.
3. Provide monthly and cumulative Project totals of Waste, quantity diverted, and percentage diverted.
4. Note that the unit of measurement may be either tons or cubic yards but must be consistent for all shipments and all materials throughout the Project. Reports with inconsistent or mixed units will not be reviewed and will be Returned for re-submission.
5. Include legible copies of on-Site logs, weight tickets and receipts. Receipts must be from charitable organizations, Recycling and/or disposal site operators who can legally accept the materials for the purpose of reuse, Recycling or disposal. Contractor must save such original documents for the life of the Project plus seven (7) years.

F. LEED Submittal: For LEED-designated projects, submit final LEED construction Waste report signed by the Contractor, tabulating total Waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met. Waste report must include:
   1. At least four (4) material streams for diverted materials;
   2. Documentation of Recycling rates for commingled facilities; and
   3. For Waste-to-Energy strategy, submit documentation of facility adherence to relevant EN standards, and justification for the strategy.

G. Refrigerant Recovery: Where refrigerant is recovered, submit statement of refrigerant recovery, which must include:
   1. Name, address, qualification data and signature of the refrigerant recovery technician responsible for recovering refrigerant;
   2. Statement that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations; and
   3. Date refrigerant was recovered.

1.8 QUALITY ASSURANCE:

A. The Contractor must designate a Construction Waste Management Representative to ensure compliance

with this section. The Representative must be present at the Project Site full-time and for the duration of the Project.

B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

C. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

D. Waste Management Plans, documentation, and implementation must be discussed at the following meetings:

1. Pre-demolition kick-off meeting;
2. Pre-construction kick-off meeting;
3. Regular job-site meetings; and
4. Contractor toolbox meetings.

E. For LEED v4 projects, Waste-to-Energy Facilities: Comply with EN standards for Waste management and emissions into air, soil, surface water, and groundwater.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 WASTE PLAN IMPLEMENTATION:

A. Prior to the demolition and construction start, the Contractor must implement the Waste Management Plan, coordinate the Plan with all affected trades, and designate one individual as the Construction Waste Management Representative. The Representative will be responsible for communicating the progress of the Plan with the Commissioner on a regular basis and for assembling the required LEED documentation.

B. The Contractor must be responsible for the provision of containers and the removal of all Waste, non-Returned surplus materials and rubbish from the Site in accordance with the approved Waste Management Plan. The Contractor must oversee and document the results of the Plan. Monies received for Salvaged materials must remain with the Contractor, except the monies for those items specifically identified elsewhere in the specifications or indicated on the Contract Drawings as belonging to others.

C. Responsibilities of Subcontractors: Each Subcontractor must be responsible for collecting its Waste, non-Returned surplus materials and rubbish, in accordance with the Waste Management Plan.

D. Distribution: The Contractor must distribute copies of the Waste Management Plan to each Subcontractor,Resident Engineer, Construction Manager, and the Commissioner.

E. Instruction: The Contractor must provide on-Site instruction of proper Waste management procedures to be used by all parties at appropriate stages of the Project.

F. Procedures: Conduct Waste management operations to ensure minimum interference with Site vegetation, roads, streets, walkways and other adjacent, occupied, and used facilities. The waste management operations include, but are not limited to:

1. Collect commingled Waste and/or separate all Recyclable Waste in accordance with the Plan. Specific areas on the Project Site are to be designated, and appropriate containers and bins clearly marked with acceptable and unacceptable materials.
2. Inspect containers and bins for contamination and remove contaminated materials if found. Comply with requirements in the following General Conditions sections for controlling dust and dirt, environmental protection, and noise control: Section 01 81 19 - INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS, Section 01 81 13.03 - SUSTAINABLE

DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 - SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS, Section 01 10 00 – SUMMARY, Section 01 35 26 - SAFETY REQUIREMENTS PROCEDURES, Section 01 50 00 - TEMPORARY FACILITIES, SERVICES AND CONTROLS, and Section 01 73 00 – EXECUTION..

3.2 ADDITIONAL DEMOLITION AND SALVAGE REQUIREMENTS:

A. Demolition and Salvage of additional items indicated in other sections of the Project Specifications require special attention as part of the overall seventy-five percent (75%) Diversion from Landfill. Specific requirements for special attention are designated in other sections of the Project Specifications.

3.3 DISPOSAL:

A. General: Except for items or material to be Salvaged, Recycled, or otherwise Reused, remove Waste material from the Project Site and legally dispose of them in a manner acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow Waste materials that are to be disposed of to accumulate on Site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn Waste materials.

C. Disposal: Transport Waste materials off Project Site and legally dispose of them.

END OF SECTION 01 74 19

Department of Design and Construction

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT LOG

Project Name: _____
Project I.D.: _____

Contractor: _____
Prepared by: _____
For Month: _____

Haul Date	Ticket #	Hauling Company	*Material Type[2]	Sorting Method[5]	Material Quantity (tons or cubic yards)[1]				*Material Recipient
					*Total Weight	Excluded Material[3]	*Diverted Material[4]	*Landfilled Material	
					*Total		*Diverted	*Landfilled	
				Monthly Totals					
				% Diverted this Month*					
				Cumulative Totals					
				% Diverted to Date					

Notes:

1. Volume (cubic yards) may be used instead of weight if used for ALL amounts and ALL materials.
2. Includes concrete; bricks; concrete masonry units (CMU); asphalt; metals; clean dimensional wood; carpet and pad; drywall; ceiling tiles; cardboard, paper, and packaging; and any other Reuse items indicated on the Contract Drawings and/or elsewhere in the Specifications.
3. Excluded material includes soil or land clearing debris and for LEED v4 projects, Alternative Daily Cover (ADC) such as screen fines and 6” minus.
4. Diverted material includes Recycled and Reused material diverted from landfill. Recycled material is reprocessed into new products. Reused material is reclaimed, Salvaged or otherwise used in its original form, either on-site or off-site.
5. Sorting Method must be classified as On-Site Sorted, Off-Site Sorted Method 1, or Off-Site Sorted Method 2.

* These items must be listed in order to receive LEED credit.

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes administrative and general procedural requirements for Closeout Procedures, including, without limitation, the following:

1. Definitions
2. Substantial Completion
3. Final Acceptance
4. Warranties
5. Final Cleaning

B. LEED: Refer to the Addendum to identify whether this Project is designed to comply with a Certification Level according to the U.S. Green Building Council's (USGBC) Leadership in Energy & Environmental Design (LEED) Rating System, as specified in Section 01 81 13.03 “SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS” or Section 01 81 13.04 “SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS”.

C. COMMISSIONING: Refer to the Addendum to identify whether this Project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning must be in accordance with ASHRAE and USGBC LEED- NC procedures, as described in Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS and Section 01 91 15 GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE. The Contractor must cooperate with the Commissioning Agent and provide whatever assistance is required.

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 33 00 SUBMITTAL PROCEDURES
C. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
D. Section 01 78 39 CONTRACT RECORD DOCUMENTS
E. Section 01 79 00 DEMONSTRATION AND OWNER’S PRE-ACCEPTANCE ORIENTATION

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Term	Definition
Design Consultant	The entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the Design Consultant may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.5 SUBSTANTIAL COMPLETION:

A. Preliminary Procedures: Before requesting inspection to determine the date of Substantial Completion, the Contractor must complete and supply all items required by the Contract Specifications, General Conditions, Addendum to the General Conditions, change orders or other directives from the Commissioner's representatives. The required items will include all Contract requirements for Substantial Completion, including, but not limited to, items related to releases, regulatory approvals, warranties and guarantees, record documents, testing, demonstration and orientation, final clean up and repairs, and all specific checklist of items by the Resident Engineer. (See Attachment "A" at the end of this section for sample requirements for Substantial Completion).

B. The Contractor must prepare and submit a list to the Resident Engineer of incomplete items, the value of incomplete construction, and reasons the Work is not complete.

C. Inspection: The Contractor must submit to the Resident Engineer a written request for inspection for Substantial Completion. Within ten (10) Days of receipt of the request, the Resident Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. The Resident Engineer may request the services, as required, of the Design Consultant, client agency representative and/or other entities having involvement with the Work to assist in the inspection of the Work. If the Resident Engineer makes a determination that the Work is Substantially Complete and approves the Final Approved Punch List and the date for Final Acceptance, he/she will so advise the Commissioner and recommend issuance of the Certificate of Substantial Completion. If the Resident Engineer determines that the Work is not substantially complete, he/she will notify the Contractor of those items that must be completed or corrected before the Certificate of Substantial Completion will be issued.

1 Re-inspection: Contractor must request re-inspection when the Work identified in previous inspections as incomplete are completed or corrected.
2 Results of completed inspection will form the basis of the requirements for Final Acceptance.

1.6 FINAL ACCEPTANCE:

A. Preliminary Procedures: Before requesting final inspection for Final Acceptance of the Work, the Contractor must complete the following. (Note that the following are to be completed, submitted as appropriate, and approved by the Commissioner, as applicable, prior to the final inspection and are not to be submitted for approval or otherwise at the final inspection unless specifically indicated). List exceptions in the request.

1. Verify that all required submittals have been provided to the Commissioner including, but not limited to, the following:

   a. Manufacturer's cleaning instructions;

   b. Posted instructions;

   c. As-built Contract Documents (Drawings, Specifications, and product data) as described in Section 01 78 39 CONTRACT RECORD DOCUMENTS, incorporating any changes required

by the Commissioner as a result of the review of the submission prior to the pre-final inspection;

d. Operation and maintenance manuals, including preventive maintenance, special tools, repair requirements, parts list, spare parts list, and operating instructions;

e. Completion of required demonstration and orientation, as applicable, of designated personnel in operation and maintenance of systems, sub-systems and equipment;

f. Applicable LEED Building submittals as described in Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS; and

g. Construction progress photographs as described in Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION.

2. Submit a certified copy of the Final Approved Punch List of items to be completed or corrected. The certified copy of the Punch List must state that each item has been completed or otherwise resolved for acceptance, and must be endorsed and dated by the Contractor.

3. Submit pest-control final inspection report and survey as required in Section 01 50 00 TEMPORARY FACILITIES AND CONTROLS.

4. Submit record documents and similar final record information.

5. Deliver tools and similar items.

6. Complete final clean-up requirements including touch-up painting of marred surfaces.

7. Submit final meter readings for utilities, as applicable, a measured record of stored fuel, and similar data as of the date when the City took possession of and assumed responsibility for corresponding elements of the Work.

B. Final Inspection: The Contractor must submit to the Resident Engineer a written request for inspection for Final Acceptance of the Work. Within ten (10) Days of receipt of the request, the Resident Engineer will either proceed with inspection or notify the Contractor of unfulfilled requirements. The Resident Engineer may request the services, as required, of the Design Consultant, client agency representative and/or other entities having involvement with the Work to assist in the inspection of the Work. If the Resident Engineer finds that all items on the Final Approved Punch List are complete and no further Work remains to be done, he/she will so advise the Commissioner and recommend the issuance of the determination of Final Acceptance. If the Resident Engineer determines that the Work is not complete, the Resident Engineer will notify the Contractor of those items that must be completed or corrected before the determination of Final Acceptance will be issued.

C. Final Acceptance: The Work will be accepted as final and complete as of the date of the Resident Engineer's inspection if, upon such inspection, the Resident Engineer finds that all items on the Final Approved Punch List are complete and no further Work remains to be done. The Commissioner will then issue a written determination of Final Acceptance.

1.7 WARRANTIES:

A. Schedule B of the Addendum lists the items of materials and/or equipment for which manufacturer warranties are required. For each item of material and/or equipment listed in Schedule B, the Contractor must obtain a written warranty from the manufacturer. Such warranty must provide that the material or equipment is free from defects for the period set forth in Schedule B and will be replaced or repaired within such specified period. The Contractor must deliver all required warranties to the Commissioner.

B. Unless indicated otherwise, warranties are to take effect on the date of Substantial Completion.

C. Submittal Time: Submit written warranties on request of the Commissioner for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

D. Partial Occupancy: Submit properly executed warranties to the Commissioner within fifteen (15) Days of completion of designated portions of the Work that are completed and occupied or used by the City.

E. Organize the warranty documents into an orderly sequence based on the Project Specification Divisions and Section Numbers.

1. Bind warranties in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Identify each binder on the front and spine with the typed or printed title "WARRANTIES"; name and location of Project; Capitol Budget Project Number (FMS ID); and Contractor's and applicable Subcontractor's name and address.
3. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation.
4. Provide a typed description of each product or installation being warranted, including the name of the product, and the name, address, and telephone number of the installer.

F. When warranted materials and/or equipment require operation and maintenance manuals, provide additional copies of each required warranty in each required manual. Refer to Section 01 78 39 CONTRACT RECORD DOCUMENTS, for requirements of operation and maintenance manuals.

PART II – PRODUCTS

2.1 MATERIALS:

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART III – EXECUTION

3.1 FINAL CLEANING:

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations, as applicable, before requesting inspection for Final Acceptance of the Work for the entire Project or for a portion of the Project:

a. Clean Project Site, yard, and grounds in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

d. Remove tools, construction equipment, machinery, and surplus material from Project Site.

e. Remove snow and ice to provide safe access to building.

f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

h. Sweep concrete floors broom clean in unoccupied spaces.

i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.

j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.

k. Remove labels that are not permanent.

l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

n. Replace parts subject to unusual operating conditions.

o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

q. Clean ducts, blowers, and coils if units were operated without filters during construction.

r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

s. Leave Project clean and ready for occupancy.

t. Construction Waste Disposal: Comply with waste disposal requirements in Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests, as required in Section 01 50 00 TEMPORARY FACILITIES, SERVICES AND CONTROLS. Prepare and submit a pest control report to the Commissioner.

D. Comply with all applicable safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on City's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project Site and dispose of lawfully.

END OF SECTION 01 77 00

SECTION 01 77 00

ATTACHMENT 'A'

The following list is a general sample of Substantial Completion requirements, including, but not limited to:

1. Prepare and submit a list to the Resident Engineer of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
2. Obtain and submit any necessary releases enabling the City unrestricted use of the Project and access to services and utilities.
3. Regulatory Approvals: Submit all required documentation from applicable governing authorities, including, but not limited to, the New York City Department of Buildings (DOB); Department of Transportation (DOT); Department of Environmental Protection (DEP); Fire Department (FDNY); etc. Documentation includes, but is not limited to, the following:
   a. Building permits, applications and sign-offs;
   b. Permits and sign-off for construction fences; sidewalk bridges; scaffolds, cranes and derricks; utilities; etc.;
   c. Certificates of inspections and sign-offs;
   d. Required certificates and use permits; and
   e. Certificate of Occupancy (C.O.), Temporary Certificate of Occupancy (T.C.O.) or Letter of Completion as applicable.
4. Submit specific warranties required by the Specifications, final certifications, and similar documents.
5. Prepare and submit Contract Documents as described in Section 01 78 39, CONTRACT RECORD DOCUMENTS, including but not limited to:
   a. Approved documentation from governing authorities;
   b. As-built record drawings and Specifications; product data; operation and maintenance manuals;
   c. Final Completion construction photographs;
   d. Damage or settlement surveys;
   e. Final property surveys; and
   f. Similar final record information.
   g. The Resident Engineer will review the submission and provide appropriate comments. If comments are significant, the initial submission will be returned to the Contractor for correction and re-submission incorporating the comments prior to the Final Inspection.
6. Record Waste Management Progress Report: Submit Construction & Demolition (C&D) Waste Management logs, with legible copies of weight tickets and receipts required in accordance with Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.
7. If applicable submit LEED letter template in accordance with the requirements of Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.

8. Schedule applicable demonstration and orientation required in other sections of the Project Specifications and as described in Section 01 79 00 DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION.
9. Deliver tools and similar items to location designated by Resident Engineer. Label with manufacturer's name and model number where applicable.
10. Make final changeover of permanent locks and deliver keys to the Resident Engineer. Advise Commissioner of changeover in security provisions.
11. Complete startup testing of systems as applicable.
12. Submit approved test/adjust/balance records.
13. Terminate and remove temporary facilities from Project Site, along with mockups, construction tools, and similar elements as directed by the Resident Engineer.
14. If applicable, complete Commissioning requirements as defined in Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS and/ or Section 01 91 15 BUILDING ENCLOSURE COMMISSIONNING REQUIREMENTS.
15. Complete final cleaning requirements, including touchup painting.
16. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

SECTION 01 78 39
CONTRACT RECORD DOCUMENTS

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes administrative and general procedural requirements for Contract Record Documents, including:

1. Contract Record Drawings
2. Record Specifications, Addenda and Change Orders
3. Record Product Data
4. Record Sample Submittal
5. Construction Record Photographs
6. Operating and Maintenance Manuals
7. Final Site Survey
8. Demonstration and Orientation DVD
9. Guarantees and Warranties
10. Waste Disposal Documentation
11. LEED Materials and Matrix
12. Miscellaneous Record Submittals

B. The Department of Design and Construction (DDC), at the start of construction (kick-off meeting), will furnish to the Contractor, at no cost, a complete set of Contract Record Drawings (PDF set) pertaining to the Work to be performed under the Contract. It is the responsibility of the Contractor to modify the Contract Drawings to indicate all changes and corrections, if any, occurring in the Work as actually installed. The Contractor is required to furnish all other drawings, if necessary, such as Addenda Drawings and Supplementary Drawings as may be necessary to indicate all Work in detail as actually completed. <u>All professional seals must be blocked out</u>. Title box complete with Project title and Design Consultants' names will remain.

C. Maintenance of Documents and Samples: The Contractor must maintain, during the progress of the Work, an accurate record of the Work as actually installed, on Contract Record Drawings (PDF set). Store Contract Record Documents and samples in the field office apart from the Contract Documents used for construction. Do not use Contract Record Documents for construction purposes. Maintain Contract Record Documents in good order and in a clean, dry, legible condition. Make documents and samples available at all times for the Resident Engineer's inspections.

1. The Contractor's attention is particularly directed to the necessity of keeping accurate records of all subsurface and concealed Work, so that the Contract Record Drawings contain this information in exact detail and location. Contract Record Drawings must also show all connections, valves, gates, switches, cut-outs and similar operating equipment.

2. For projects designated to achieve a Leadership in Energy and Environmental Design (LEED) rating, the Contractor will receive a copy of the Project's LEED scorecard for the purpose of monitoring compliance with the target objectives and to facilitate coordination with the LEED Consultant. The Contractor will receive periodic updates of this scorecard and is required to submit the final version of the Scorecard at Substantial Completion with other Project Record Documents.

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
C. Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION
D. Section 01 33 00 SUBMITTAL PROCEDURES
E. Section 01 77 00 PROJECT CLOSEOUT PROCEDURES

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Term	**Definition**
Commissioning Authority / Commissioning Agent (CxA)	The entity responsible for providing commissioning services for the Project. The entity serving as the CxA may be either an employee(s) of the City or an entity engaged by the City to provide such services.
Design Consultant	The entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the Design Consultant may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.
LEED Consultant	The entity responsible for providing LEED sustainability services for the Project. The entity serving as the LEED Consultant may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.5 SUBMITTALS:

A. As-Built Contract Record Drawings: The Contractor must comply with the following:

1. Progress Submission: As directed by the Resident Engineer, submit progress as-built Contract Record Drawings at the fifty percent (50%) construction completion stage.

2. Final Submission: Before Substantial Completion payment, the Contractor must furnish to the Commissioner one (1) complete set of marked-up as-built Contract Record Drawings, in PDF indicating all of the Work and locations as actually installed.

3. As-built Contract Record Drawings must be of the same size as that of the Contract Drawings, with a one (1) inch margin on three (3) sides and a two (2) inch margin on the left side for binding.

4. Each as-built Contract Record Drawing must bear the legend "AS-BUILT CONTRACT RECORD DRAWING" in heavy block lettering, one half (l/2) inch high, and contain the following data:

AS-BUILT CONTRACT RECORD DRAWING

Contractor's Name		_____
Contractor's Address		_____
Subcontractor's Name (where applicable)		_____
Subcontractor's Address		_____
Made by:	Date	_____
Checked by:	Date	_____

Commissioner's Representatives	
(Resident Engineer)	DDC
(Plumbing Inspector)	DDC
(Heating & Ventilating Inspector)	DDC
(Electrical Inspector)	DDC

5. Contract Record Drawing Title Sheet: The Contractor must prepare a title sheet, the same size as the Contract Record Drawings, which must contain the following:

   a. Heading:
      The City of New York
      Department of Design and Construction
      Division of Public Buildings
   b. Capital Budget Project Number (FMS ID)
   c. Name and Location of Project
   d. Contractor's Name and Address
   e. Subcontractor's Name and Address (where applicable)
   f. Record of changes (a caption description of work affected, and the date and number of change order or other authorization)
   g. List of Record Drawings

B. Record Specifications, Addenda and Change Order: Submit to the Commissioner two (2) copies each of marked-up Record Specifications, Addenda and change orders.

C. Record Product Data: Submit to the Commissioner two (2) sets of Record Product Data.

D. Record Construction Photographs: Submit to the Commissioner final as-built construction photographs and digital files of the completed Work as described in Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION.

E. Operating and Maintenance Manuals:

   1. Submit three (3) copies each of preliminary manuals to the Resident Engineer for review and approval. The Contractor must make such corrections, changes and/or additions to the manual until deemed satisfactory by the Resident Engineer. Deliver three (3) copies of the final approved manuals to the Resident Engineer for distribution.

   2. Commissioning: Comply with the requirements of Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS and 01 91 15 GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE, as well as the requirements set forth in sections of the Project Specifications, for projects designated for commissioning. Submit four (4) copies each of data designated to be included in the commissioning operation and maintenance manual to the Resident Engineer. The Resident Engineer will forward such data to the Commissioning Authority/Agent (CxA) for review and comment. The Contractor must make such corrections, changes and/or additions to the data until deemed satisfactory and deliver four (4) copies of the final data to the Resident Engineer for use by the CxA to prepare the commissioning operation and maintenance manual.

a. Non-Commissioning Data: All remaining data not designated for commissioning and required as part of maintenance and operation manual must be prepared and assembled in accordance with the requirements of this section for operating and maintenance manuals.

F. Final Site Survey: Submit Final Site survey as described in Section 01 73 00, EXECUTION, in quantities requested by the Commissioner, signed and sealed by a Land Surveyor licensed in the State of New York.

G. Guarantees and Warranties.

H. Waste Disposal Documents and Miscellaneous Record Documents.

PART II – PRODUCTS

2.1 CONTRACT RECORD DRAWINGS:

A. Record Prints: The Contractor must maintain one (1) set of blue- or black-line white prints as applicable of the Contract Record Drawings and Shop Drawings. If applicable, the Contract Record Drawings and Shop Drawings must incorporate the arrangement of the Work based on the accepted master coordination drawing(s) as described in Section 01 33 00, SUBMITTAL PROCEDURES.

1. Preparation: The Contractor must mark record drawings to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is installer, Subcontractor, or similar entity, to prepare the marked-up Record Prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an understandable drawing technique.
c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Change Orders: All changes from Contract Drawings must be distinctly encircled and identified by change order number correlating to changes listed on the "Title Sheet." The Contractor must show within the encircled areas the work as actually installed.

B. Content: Types of items requiring marking include, but are not limited to, the following:

1. Dimensional changes to Contract Record Drawings;
2. Revisions to details shown on Contract Record Drawings;
3. Depths of foundations below first floor;
4. Locations and depths of underground utilities;
5. Revisions to routing of piping and conduits;
6. Revisions to electrical circuitry;
7. Actual equipment locations;
8. Duct size and routing;
9. Locations of concealed internal utilities;
10. Changes made by change order;
11. Changes made following Commissioner’s written orders;
12. Details not on the original Contract Drawings;
13. Field records for variable and concealed conditions; and
14. Record information on the Work that is shown only schematically.

C. Progress Record Prints: As directed by the Resident Engineer, at fifty percent (50%) construction completion, review marked-up Record Prints with the Resident Engineer and the Design Consultant. When directed by the Resident Engineer, transfer progress mark-ups to a PDF set and submit to the Resident Engineer.

D. Final Contract Record Prints: Immediately before final inspection for the Certificate of Substantial Completion, review marked-up record prints with the Resident Engineer and the Design Consultant. When authorized, complete mark-up of a full set of corrected PDF prints of the Contract Drawings.

1. Incorporate changes and additional information previously marked on Record Prints. Erase, redraw, and add details and notations where applicable.
2. Refer instances of uncertainty to Resident Engineer for resolution.
3. Submit the as-built Contract Record Drawings and Shop Drawings for use as record prints as described in Sub-Section 1.5.

2.2 RECORD SPECIFICATIONS, ADDENDA AND CHANGE ORDERS:

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, Addenda, and Contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether record product data has been submitted in operation and maintenance manuals instead of submitted as record product data.
5. Note related change orders and Contract Record Drawings where applicable.
6. Upon completion of mark-up, submit two (2) complete copies of the marked-up record Specifications to the Commissioner.

2.3 RECORD PRODUCT DATA:

A. Preparation: Mark product data to indicate the actual product installation where installation varies substantially from that indicated in product data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project Site and changes in manufacturer's written instructions for installation.
3. If possible, a change order proposal should include resubmitting updated product data. This eliminates the need to mark up the previous submittal.
4. Note related change orders and Contract Record Drawings where applicable.
5. Upon completion of mark-up, submit to the Commissioner two (2) sets of the marked-up record product data.
6. Where record product data is required as part of maintenance manuals, submit marked-up product data as an insert in the manual instead of submittal as record product data.

2.4 RECORD SAMPLE SUBMITTAL:

A. Prior to the date of Substantial Completion, the Contractor must meet with the Resident Engineer at the Site to determine which of the samples maintained during the construction period must be transmitted to the Commissioner for record purposes.

B. Comply with the Resident Engineer's instructions for packaging, identification marking, and delivery to DDC. Dispose of other samples as specified for disposal of surplus and waste material.

2.5 CONSTRUCTION RECORD PHOTOGRAPHS:

A. The Contractor must submit the final completion construction photographs, in compliance with Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION.

2.6 OPERATING AND MAINTENANCE MANUALS:

A. The Contractor must provide preliminary and final versions of operating and maintenance manuals required for those systems, equipment, and materials listed in other Sections of the Project Specifications.

B. Format: Prepare and assemble operation and maintenance manuals in heavy-duty, 3-ring, hardback loose leaf binders in the form of an instructional manual. All binders for each discipline must be the same color. When multiple binders are used, correlate data into related consistent groupings. Binder front must contain permanently attached labels displaying the following:

1. Heading:
   The City of New York
   Department of Design and Construction
   Division of Public Buildings
2. Capital Budget Project Number (FMS ID)
3. Name and Location of Project
4. Contractor's Name and Address
5. Subcontractor's Name and Address (where applicable)
6. Dates of the Work covered by the contents of the Project Manual.
7. Binder spine must display Project Number (FMS ID) and date of completion.

C. Organization: Include a section in the directory for each of the following:

1. List of documents
2. List of systems
3. List of equipment
4. Table of contents

D. Each manual must contain the following materials, in the order listed:

1. Title page
2. Table of contents
3. Manual contents

E. Arrange contents alphabetically by system, subsystem, and equipment. Cross-reference Specification Section numbers. Provide tabbed flyleaf for each separate product, equipment and/or system/subsystem with typed description of product and major component parts of equipment.

F. Safety warnings or cautions must be visibly highlighted within each maintenance procedure. Use of such highlights must be limited to only critical items and must not be used in an excessive manner which would reduce their effectiveness.

G. For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts. Vendors and supplier listings are to include names, addresses and telephone numbers, including nearest field service telephone numbers.

H. Where contents of the manual include any manufacturer's catalog pages, clearly indicate the precise items and options included in the installation and delete all manufacturers' data regarding products not included in the installation.

I. All material within manuals must be new. Copies used for prior submittals or used in construction must not be used.

J. Submit preliminary and final manual editions to the Commissioner according to the approved progress schedule.

K. Manuals must present all technical material to the greatest extent possible, with respect to text, tabular matter and illustrations. Illustrations must preferably consist of line drawings. All applicable drawings must be included. If available, color photograph prints may be included.

L. Preliminary manual editions must be as technically complete as the final manual edition. All illustrations must be in final forms.

M. Final manual editions must be technically accurate and complete and must represent all “as-built” systems, pieces of equipment, or materials, which have been accepted by the Commissioner. All illustrations, text and tabular material must be in final form. All shop drawings must be included as specified in individual Specification Sections.

N. Building products, applied materials, and finishes: Include product data, with catalog number, size, composition, and color texture designations. Where applicable, provide information for re-ordering custom manufactured products.

O. Instructions for care and maintenance: Include manufacturers’ recommendations for cleaning agents and methods, and recommended schedule for cleaning and maintenance.

P. Moisture protection and weather exposed products: Include product data listing applicable reference standards, chemical compositions, and details of installation. Provide recommendations for inspections, maintenance, and repair.

Q. Additional requirements: Specified in individual Specification Sections.

2.7 FINAL SITE SURVEY

A. The Contractor must submit the final certification and final survey in compliance with Section 01 73 00 EXECUTION.

2.8 DEMONSTRATION AND ORIENTATION DVD:

A. The Contractor must submit a final version of applicable demonstration and training electronic recordings in compliance with Section 01 79 00 DEMONSTRATION AND OWNER’S PRE-ACCEPTANCE ORIENTATION.

2.9 GUARANTEES AND WARRANTIES:

A. SCHEDULE B: Requirements for guarantees and warranties for the Project are set forth in Schedule B, which is included as part of the Addendum.

B. FORM: For all guaranty requirements set forth in Schedule B, the Contractor must provide a written guaranty, in the form set forth herein.

C. Submit fully executed and signed manufacturers’ warranties as listed in the Project Specifications and outlined in Schedule B of the Addendum. Refer to Section 01 77 00, CLOSEOUT PROCEDURES for submittal requirements.

GUARANTY

DDC PROJECT # _____

PROJECT DESCRIPTION _____

_____

CONTRACT # _____

SPECIFICATION SECTION # AND TITLE _____

_____

GUARANTY TO BE IN EFFECT FROM _____

TO _____

The Contractor hereby guarantees that the Work specified under the above section of the aforesaid Contract will be free from defects of material and/or workmanship, for the period indicated above.

The Contractor also guarantees that it will promptly repair, restore, rebuild or replace whichever may be deemed necessary by the City, any or all defective material or workmanship of the aforementioned section, that may appear within the guaranty period and any finished Work to which damage may occur because of such defects, to the satisfaction of the City and without any cost or expense to the City.

The Contractor hereby agrees to pay to the City the cost of the repairs or replacements should the City make the same because of the failure of the Contractor to do so.

Contractor: _____

By: _____
Signature of Partner or Corporate Officer

Print Name: _____

Subscribed and sworn to before me this
day of _____ , year _____

_____
Notary Public

2.10 WASTE DISPOSAL DOCUMENTATION:

A. Certify and deliver to the Commissioner all documentation including reports, receipts, certificates, records etc. for the collection, handling, storage, classification, testing, transportation, recycling and/or disposal of all Non-Hazardous Construction Waste as required by Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL, and Hazardous Waste as required by other Project Specification Sections. Certify compliance with all applicable governing laws, codes, rules and regulations.

2.11 MISCELLANEOUS RECORD DOCUMENTS:

A. Refer to other Project Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Prior to Final Acceptance, complete miscellaneous records and place in good order, properly identified and bound or otherwise organized to allow for use and reference.

B. Submit three (3) copies of each document to the Commissioner or as otherwise directed by the Commissioner.

PART III – EXECUTION

3.1 RECORDING AND MAINTENANCE:

A. Recording: Maintain one (1) copy of each submittal during the construction period for Contract Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of the Project.

B. Maintenance of Record Documents and Samples: Store Contract Record Documents and samples in the field office apart from the Contract Documents used for construction. Do not use Contract Record Documents for construction purposes. Maintain Contract Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to the Contract Record Documents for the Resident Engineer's reference during normal working hours.

END OF SECTION 01 78 39

SECTION 01 79 00
DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 79 00

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This section includes administrative and procedural requirements, when set forth in sections of the Project Specifications, for instructing the facility's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Owner's pre-acceptance orientation in operation and maintenance of systems, subsystems, and equipment.
3. Demonstration and orientation video recordings.

B. The Contractor must provide the services of orientation specialists from the Contractor's equipment manufacturers. The specialists must be experienced in the type of equipment to be demonstrated.

C. Separate orientation sessions must be conducted for mechanical operations and maintenance personnel and for electronic and electrical maintenance personnel.

D. Commissioning: Refer to the Addendum to identify whether this project is to be commissioned. For commissioned projects, the Contractor must provide demonstration and orientation as described in this section and cooperate with the Commissioning Authority/Agent (CxA) to implement commissioning requirements as described in Section 01 91 13, GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS, and/ or Section 01 91 15 BUILDING ENCLOSURE COMMISSIONNING REQUIREMENTS.

1.3 RELATED SECTIONS: include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 33 00 SUBMITTAL PROCEDURES
C. Section 01 77 00 CLOSEOUT PROCEDURES
D. Section 01 78 39 CONTRACT RECORD DOCUMENTS
E. Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS
F. Section 01 91 15 BUILDING ENCLOSURE COMMISSIONNING REQUIREMENTS
G. Specific requirements for demonstration and orientation indicated in other sections of the Project Specifications.

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Term	Definition
Commissioning Authority / Commissioning Agent (CxA)	The entity responsible for providing commissioning services for the Project. The entity serving as the CxA may be either an employee(s) of the City or an entity engaged by the City to provide such services.
Design Consultant	The entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the Design Consultant may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

1.5 SUBMITTALS:

A. Instruction Program: Submit three (3) copies of an outline of the instructional program for demonstration and orientation, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each orientation module to the Commissioner for approval no less than thirty (30) Days prior to the date the proposed orientation is to take place. Include learning objectives and outline for each orientation module.

1. At completion of orientation, submit three (3) complete training manual(s) and three (3) applicable video recording(s) to the Commissioner for the facility's and City's use.

B. Qualification Data: For facilitator, instructor and videographer.

C. Attendance Record: For each orientation module, submit a list of participants and length of instruction time.

D. Evaluations: For each participant and for each orientation module, submit results and documentation of performance-based test.

E. Submit all final orientation materials to the Resident Engineer a minimum of fourteen (14) Days prior to the scheduled orientation.

F. Demonstration and Orientation Recordings:

1. All Projects:

a. The Contractor must submit to the Commissioner three (3) copies of demonstration and orientation video recordings within seven (7) Days of end of each orientation module.

b. Identification: On each copy, provide an applied label with the following information:

1) Project Contract I.D. Number
2) Project Contract Name
3) Name of Contractor
4) Name of Subcontractor as applicable
5) Name of Design Consultant
6) Name of Construction Manager as applicable
7) Date recorded

8) Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
9) Table of Contents including list of systems covered.

c. Transcript: Prepared on 8-1/2-by-11-inch paper, punched and bound in heavy-duty, 3-ring, vinyl-covered binders. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding DVD recording. Include name of Project and date of recording on each page.

d. Commissioned Projects: The Contractor must submit one (1) additional copy of the demonstration and orientation video recording to the CxA through the Resident Engineer who will include the approved recording in the commissioning report.

1.6 QUALITY ASSURANCE:

A. Facilitator Qualifications: A firm or individual experienced in orientation or educating maintenance personnel in an orientation program similar in content and extent to that indicated for this Project.

B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 01 40 00 QUALITY REQUIREMENTS, experienced in operation and maintenance procedures and orientation.

C. Videographer Qualifications: A professional videographer who has experience with orientation and construction projects.

D. Pre-Instruction Conference: Schedule with the Resident Engineer a conference at Project Site in accordance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION. Review methods and procedures related to demonstration and orientation including, but not limited to, the following:

1. Inspect and discuss locations and other facilities required for instruction.
2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
3. Review required content of instruction.
4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.7 COORDINATION:

A. Coordinate instruction schedule with the Resident Engineer and facility's operations. Adjust schedule as required to minimize disrupting facility's operations.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of orientation modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by the Commissioner.

PART II – PRODUCTS

2.1 INSTRUCTION PROGRAM:

A. Program Structure: Develop an instruction program that includes individual orientation modules for each system and equipment not part of a system, as specified and required by individual Specification Sections.

B. Orientation Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:

1. For basis of system design, operational requirements, and criteria, include the following:
   a. System, subsystem, and equipment descriptions;
   b. Performance and design criteria if Contractor is delegated design responsibility;
   c. Operating standards;
   d. Regulatory requirements;
   e. Equipment function including auxiliary equipment and systems;
   f. Operating characteristics;
   g. Limiting conditions; and
   h. Performance curves.

2. For documentation, review the following items in detail:
   a. Emergency manuals;
   b. Operations manuals;
   c. Maintenance manuals;
   d. Project Record Documents;
   e. Identification systems; and
   f. Warranties.

3. For emergencies, include the following, as applicable:
   a. Instructions on meaning of warnings, trouble indications, and error messages;
   b. Instructions on stopping;
   c. Shutdown instructions for each type of emergency;
   d. Operating instructions for conditions outside of normal operating limits;
   e. Sequences for electric or electronic systems; and
   f. Special operating instructions and procedures.

4. For operations, include the following, as applicable:
   a. Startup procedures;
   b. Equipment or system break-in procedures;
   c. Routine and normal operating instructions;
   d. Regulation and control procedures;
   e. Control sequences;
   f. Safety procedures;
   g. Instructions on stopping;
   h. Normal shutdown instructions;
   i. Operating procedures for emergencies;
   j. Operating procedures for system, subsystem, or equipment failure;
   k. Seasonal and weekend operating instructions;
   l. Required sequences for electric or electronic systems; and
   m. Special operating instructions and procedures.

5. For adjustments, include the following:
   a. Alignments;
   b. Checking adjustments;
   c. Noise and vibration adjustments; and
   d. Economy and efficiency adjustments.

6. For troubleshooting, include the following:
   a. Diagnostic instructions; and
   b. Test and inspection procedures.

7. For maintenance, include the following:
   a. Inspection procedures;
   b. Types of cleaning agents to be used and methods of cleaning;
   c. List of cleaning agents and methods of cleaning detrimental to product;
   d. Procedures for routine cleaning;
   e. Procedures for preventive maintenance;
   f. Procedures for routine maintenance;
   g. Instruction on use of special tools; and
   h. Housekeeping practices.

8. For repairs, include the following:
   a. Diagnosis instructions;
   b. Repair instructions;
   c. Disassembly, component removal, repair, and replacement; and reassembly instructions;
   d. Instructions for identifying parts and components; and
   e. Review of spare parts needed for operation and maintenance.

PART III – EXECUTION

3.1 INSTRUCTION:

A. Facilitator: Engage a qualified facilitator to prepare the instruction program and orientation modules, to coordinate instructors, and to coordinate between Contractor and the Resident Engineer for the number of participants, instruction times, and location.

B. The Contractor must engage qualified instructors to instruct the facility's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

C. Scheduling: Schedule instruction with the Resident Engineer at mutually agreed upon times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.

   1. Schedule orientation with the Resident Engineer with at least fourteen (14) Days advance notice.

D. Evaluation: At the conclusion of each orientation module, assess and document each participant's mastery of module(s) by use of an oral or written demonstration performance-based test.

E. Cleanup: Collect and remove used and leftover educational materials from Project Site. Remove instructional equipment. Restore systems and equipment to condition existing before initial orientation use.

3.2 DEMONSTRATION AND ORIENTATION VIDEO RECORDINGS:

A. All projects:

   1. The Contractor must engage a qualified commercial videographer to video record demonstration and orientation sessions. Record each orientation module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.

   2. At the beginning of each orientation module, record each chart containing learning objective and lesson outline.

   3. All recordings must be close-captioned.

4. Recording Format: Provide high-quality video recording on USB drive or other electronic media as requested by the Commissioner.

5. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to show area of demonstration and orientation. Display continuous running time.

6. Narration: Describe scenes on the recording by audio narration by microphone while recording or by dubbing audio narration off-site after. Include description of items being viewed. Describe vantage point, indicating location, direction (by compass point), and elevation or story of construction.

7. Transcript: Provide a typewritten transcript of the narration. Display images and running time captured from opposite the corresponding narration segment.

B. Commissioned Projects: Refer to the Addendum to determine if the project is to be commissioned.

1. The Commissioning Authority/Agent (CxA) under separate contract with the City of New York will assess and comment on the adequacy of the orientation instruction sessions by reviewing the orientation and instruction program and agenda provided by the Contractor. The provider of the orientation program will video record the sessions and provide a copy to the CxA for final review and comments. If necessary, Contractor must edit the recording per CxA comments.

END OF SECTION 01 79 00

SECTION 01 81 13.03
SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 13.03

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. LEED BUILDING - GENERAL REQUIREMENTS**:**

The City of New York is committed to implementing good environmental practices and procedures which include achieving a LEED™ Green Building rating. Specific project requirements related to this goal are listed in the applicable paragraphs of this section of the General Conditions. The Contractor must ensure that these requirements, as defined in the sections below and in related sections of the Contract Documents, are implemented to the fullest extent. Substitutions, or other changes to the work proposed by the Contractor or their Subcontractors, will not be allowed if such changes compromise the stated LEED BUILDING criteria.

B. This Section includes:

1. Definitions
2. LEED Provisions
3. LEED Building Submittals
4. LEED Building Submittal Requirements
5. LEED Action Plan

1.3 RELATED SECTIONS: Include without limitation the following:

A.	Section 01 74 19	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
B.	Section 01 81 13.13	VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED v3 BUILDINGS
C.	Section 01 81 19	INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS
D.	Section 01 91 13	GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS
E.	Section 01 91 15	GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Agrifiber Products	Means products derived from recovered agricultural waste fiber from sources such as cereal straw, sugarcane bagasse, sunflower husk, walnut shells, coconut husks, and agricultural prunings, processed and mixed with resins to produce panels with characteristics similar to composite wood.
Composite Wood	Means products composed of wood or plant particles or fibers bonded by a synthetic resin or binder to produce panels such as plywood, particleboard, and medium density fiberboard (MDF). Does not include hardboard, structural panels, glued laminated timber, prefabricated wood I-joists, or finger-jointed lumber.
Design Consultant	Means the entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.
Forest Stewardship Council (FSC) Certified Wood	Means wood-based materials and products certified in accordance with the Forest Stewardship Council's principles and criteria.
LEED	Means the Leadership in Energy & Environmental Design rating system developed by the United States Green Building Council.
Rapidly Renewable Materials	Means materials made from agricultural products that are typically harvested within a ten-year or shorter cycle. Rapidly renewable materials include products made from bamboo, cotton, flax, jute, straw, sunflower seed hulls, vegetable oils, or wool.
Regionally Manufactured Materials	Means materials that are manufactured within a radius of 500 miles from the Project location. Manufacturing refers to the final assembly of components into the building product that is installed at the Project site.
Regionally Extracted, Harvested, or Recovered Materials	Means materials which are extracted, harvested, or recovered and manufactured within a radius of 500 miles from the Project site.
Recycled Content	Means The percentage by weight of constituents that have been recovered or otherwise diverted from the solid waste stream, either during the manufacturing process (pre-consumer), or after consumer use (post-consumer). Spills and scraps from the original manufacturing process that are combined with other constituents after a minimal amount of reprocessing for use in further production of the same product are not recycled materials. Discarded materials from one manufacturing process that are used as constituents in another manufacturing process are pre-consumer recycled materials. "Pre-consumer" may also be referred to as "post-industrial".
Solar Reflectance Index (SRI)	A measure of a material's ability to reflect solar heat, as shown by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is equal to 0, and a standard white (reflectance 0.80, emittance of 0.90) is equal to 100.

Volatile Organic Compound (VOC)	Any compound of carbon (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate) which vaporizes (becomes a gas) and participates in atmospheric photochemical reactions, as specified in Part 51.00 of Chapter 40 of the U.S. Code of Federal Regulations, at normal room temperatures. For the purposes of this specification, formaldehyde and acetaldehyde are considered to be VOCs.

1.5 LEED PROVISIONS:

A. Refer to the Addendum for the LEED rating to be achieved for this project. The provisions to achieve this LEED rating are integrated within the project construction documents and specifications. The Contractor is specifically directed to the "LEED BUILDING Performance Criteria" and "LEED BUILDING Submittals" sections within the contract specification. Additional LEED requirements are met through aspects of the project design, including material and equipment selections, which may not be specifically identified as LEED BUILDING requirements. Compliance with the requirements needed to obtain LEED prerequisites and credits will be used as one criterion to evaluate substitution requests.

1.**6 LEED BUILDING SUBMITTALS:**

A. Scope: LEED BUILDING submittals are required for all installed materials included in General Construction work. LEED BUILDING Submittals are only required for field-applied adhesives, sealants, paints and coatings included in Plumbing, Mechanical and Electrical work. Submit all required LEED BUILDING submittals in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

B. Applicability: The extent of the LEED BUILDING Submittals varies depending on the specification section. Applicable LEED BUILDING Submittals are listed under the "LEED BUILDING Submittals" heading in each specification section. The detailed requirements for the LEED BUILDING Submittals are defined in Item C below.

C. Detailed Requirements: Sub-Sections 1.6 C.1through 1.6 C.3 below defines the information and documents to be provided for each type of LEED BUILDING Submittal as identified in the LEED Submittal Requirements of each specification section:

1. ENVIRONMENTAL BUILDING MATERIALS CERTIFICATION FORM (EBMCF)[GHI]: Information to be supplied for this form (blank sample copy attached at end of this Section to be modified as appropriate to the project) must include some or all of the following items, as identified in the LEED Submittal Requirements of each specification section:

a. Cost breakdowns for the materials included in the contractor or sub-contractor's scope of work. Cost reporting must include itemized material costs (excluding the contractor's labor, equipment, overhead and profit).

b. The percentages (by weight) of post-consumer and/or post-industrial recycled content in the supplied product(s).

1) For each product with recycled content, also indicate the total recycled content value (1/2 x pre-consumer percentage x product value + 1 x post-consumer percentage x product value = total recycled content value).
2) See additional requirements for concrete below.

c. Identification (Yes/No) of materials manufactured within 500 miles of the project site AND containing raw materials harvested or extracted within 500 miles of the project site.

1) Indicate the percentage by weight, relative to the total weight of the product that meets these criteria.
2) Indicate the point of harvest/extraction/recovery of regional raw materials, the point of final assembly of regional manufactured products, and the distance from each point to the project site.

d. Volatile Organic Compound (VOC) content of all field-applied adhesives, sealants, paints, and coatings, listed in grams/liter or lbs./gallon, less water.

1) For detailed requirements refer to Section 01 81 13.13 VOC LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS.

e. The amount of "Forest Stewardship Council (FSC) Certified" wood products if used in the Project.

1) Record only new FSC-certified wood products. Do not record reclaimed, salvaged, or recycled FSC-certified wood products.
2) Reclaimed, salvaged, or recycled FSC-certified wood may be recorded as post-consumer recycled content.

f. The amount of Rapidly Renewable materials if used in the Project.

1) Indicate the type of rapidly renewable material used, and the percentage by weight, relative to the total weight of the product, that consists of rapidly renewable material.

g. The percentage (by weight), relative to the total weight of cementitious materials, of supplementary cementitious materials or pozzolans such as fly ash used in each concrete mix used in the Project.

1) For each concrete mix, provide a complete breakdown of all components, by weight and by cost.

h. Identification (Yes/No) of composite wood or agrifiber products used in the project that are free of added urea-added formaldehyde resins.

i. Identification (Yes/No) of flooring products used in the project that have Carpet and Rug Institute (CRI) Green Label or Green Label Plus certification, or Resilient Floor Covering Institute FloorScore certification.

1) Untreated solid wood flooring, and mineral-based flooring products such as tile, masonry, terrazzo, and cut stone that have no organic-based coatings or sealants, are excluded from this requirement.

j. The EBMCF must record the above information only for those materials or products permanently installed in the project. The EBMCF must record VOC content, composite and agrifiber products, and CRI or FloorScore ratings only for those materials or products permanently installed within the weather barrier of the LEED building.

2. EBMCF BACK-UP DOCUMENTATION: These documents are used to validate the information provided on the EBMCF (except cost data). For each material listed on the EBMCF, provide documentation to certify the material's LEED BUILDING attributes, as applicable:

a. RECYCLED CONTENT: Provide published product literature or letter of certification on the manufacturer's letterhead certifying the amounts of post-consumer and/or post-industrial content.

b. REGIONAL MANUFACTURING AND REGIONAL RAW MATERIALS (WITHIN 500 MILES): Provide published product literature or letter of certification on the manufacturer's letterhead indicating the city/state where the manufacturing plant is located, where each of the raw materials in the product were extracted, harvested or recovered and the distance in miles from the project site.

1) If only some of the raw materials for a particular product or assembly originate within 500 miles of the project site, provide the percentage (by weight) that these materials comprise in the complete product.

c. VOC CONTENT: Provide Material Safety Data Sheets (MSDS) certifying the Volatile Organic Compound (VOC) content of the adhesive, sealant, paint, or coating products. VOC content is to be reported in grams/liter or lbs./gallon, less water. If the MSDS does not show the product's VOC content, this information must be provided through other published product literature from the manufacturer, or stated in a letter of certification from the product manufacturer on the manufacturer's letterhead.

d. RAPIDLY RENEWABLE MATERIALS: If used in the project, provide published literature or letter of certification on the manufacturer's letterhead certifying the percentage of each product that is rapidly renewable (by weight).

3. PRODUCT CUT SHEETS: Provide product cut sheets with the Contractor's or sub-contractor's stamp, confirming that the submitted products are the products installed in the Project.

4. CRI GREEN LABEL PLUS CERTIFICATION: For carpets and carpet cushions, provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying that the products comply with the "Green Label Plus" IAQ testing program of the Carpet and Rug Institute of Dalton, GA.

5. CERTIFICATION OF COMPOSITE WOOD OR AGRIFIBER RESINS: For all composite wood, engineered wood and agrifiber products (including plywood, particleboard, and medium density fiberboard), provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying that that the products do not contain added urea-formaldehyde resins.

6. CERTIFICATION OF COMPOSITE WOOD OR AGRIFIBER LAMINATING ADHESIVES: For all laminating adhesives used with composite wood, engineered wood and agrifiber products (e.g., adhesives used to laminate wood veneers to an engineered wood substrate), provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying that the adhesive products do not contain urea-formaldehyde.

7. FSC-CERTIFIED WOOD:

   a. If used in the project, provide chain of custody documents and copies of invoices regarding wood products, including whether or not such wood product is FSC-certified.

   b. If used in the project, for assemblies, provide the percentage (by cost and by weight) of the assembly that is FSC-certified wood.

   c. If used in the project, for assemblies, provide published product literature or letter from the manufacturer(on the manufacturer's letterhead) verifying the percentage that is FSC-certified wood.

8. GREEN SEAL COMPLIANCE: Provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying that the following product types comply with the VOC limits and chemical component restrictions developed by the Green Seal organization of Washington, DC:

   a. Interior Architectural Paints and Coatings: refer to Green Seal standard GS-11 (1st edition, May 1993)

   b. Anti-corrosive and Anti-rust paints: refer to Green Seal standard GC-03 (2nd Edition, January 1997)

   c. Aerosol Adhesives: refer to Green Seal standard GS-36 (1st edition, October 2000)

9. HIGH ALBEDO PAVING AND WALKWAY MATERIALS: For paving and walkway materials made from concrete or brick provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying a minimum Solar Reflectance Index (SRI) value of 29. SRI

values will be calculated according to ASTM E 1980. Reflectance will be measured according to ASTM E 903, ASTM E 1918, or ASTM C 1549. Emittance will be measured according to ASTM E 408 or ASTM C 1371.

10. HIGH ALBEDO ROOFING MATERIALS: For exposed roofing membranes, pavers, and ballast products, provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the following minimum Solar Reflectance Index (SRI) values:

    a. 78 for low-sloped roofing applications (slope ≤ 2:12)

    b. 29 for steep-sloped roofing applications (slope > 2:12)

    SRI values will be calculated according to ASTM E 1980. Reflectance will be measured according to ASTM E 903, ASTM E 1918, or ASTM C 1549. Emittance will be measured according to ASTM E 408 or ASTM C 1371.

    Vegetated roof surfaces are exempt from the SRI criteria.

11. LOW MERCURY LAMPS: For all fluorescent, compact fluorescent, and HID lamps installed in the project, provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying:

    a. The mercury content or content range per lamp in milligrams or picograms;

    b. The design light output per lamp (light at 40% of a lamp's useful life) in lumens; and

    c. The rated average life of the lamp in hours.

    In addition, provide the total number of each lamp type installed in the project.

12. FLOORSCORE CERTIFICATION: For all hard surface flooring, including vinyl, linoleum, laminate flooring, wood flooring, ceramic flooring, rubber flooring, and wall base, provide published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying that the products comply with the current FloorScore standard requirements.

13. CONCRETE: Provide concrete mix design for each mix, designated by a distinct identifying code or number and signed by a Professional Engineer licensed in the state in which the concrete manufacturer or supplier is located.

14. INTERIOR LIGHTING FIXTURES: For each lighting fixture type installed within the building's weather barrier, provide manufacturer's cut sheets indicating the following:

    a. Fixture power in watts.

    b. Initial lamp lumens.

    c. Photometric distribution data.

    d. Dimming capability, in range of percentages.

15. EXTERIOR LIGHTING FIXTURES: For each lighting fixture type installed on site, provide manufacturer's cut sheets indicating the following:

    a. Fixture power in watts.

    b. Initial lamp lumens.

    c. Photometric distribution data.

    d. Range of field adjustability, if any.

    e. Warranty of suitability for exterior use.

16. ALTERNATIVE TRANSPORTATION: Provide manufacturer's cut sheets and/or shop drawings for the following items installed on site:
    a. Bike racks, including total number of bicycle slots provided.
    b. Signage indicating parking spaces reserved for electric or low-emitting vehicles and for carpools/vanpools, including total number of signs.
17. WATER CONSERVING FIXTURES: For all water consuming plumbing fixtures and fittings, provide manufacturer's cut sheets showing maximum flow rates and/or flush rates.
18. ENERGY SAVING APPLIANCES: Provide manufacturer's cut sheets and published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the product's rating under the U.S. EPA/DOE Energy Star program, for all of the following:
    a. Appliances (i.e., refrigerators, dishwashers, microwave ovens, televisions, clothes washers, clothes dryers, chilled water dispensers).
    b. Office equipment (i.e., copy machines, fax machines, plotters/printers, scanners, binding and publishing equipment).
    c. Electronics (i.e., servers, desktop computers, computer monitor displays, laptop computers, network equipment).
    d. Commercial food service equipment
19. GLAZING: For glazing in any windows, doors, storefront and window wall systems, curtainwall systems, skylights, and partitions, provide manufacturer's cut sheets indicating the following:
    a. Glazed area.
    b. Visible light transmittance.
    c. Solar heat gain coefficient.
    d. Fenestration assembly u-factor.
20. VENTILATION: Provide manufacturer's cut sheets for the following:
    a. Carbon dioxide monitoring systems, if any, installed to measure outside air delivery.
    b. Air filters: for detailed requirements refer to Section 01 81 19 INDOOR AIR QUALITY REQUIREMENTS.
21. REFRIGERATION: For all refrigeration equipment, provide manufacturer's cut sheets indicating the following:
    a. Equipment type.
    b. Equipment life. Default values specified by the 2007 ASHRAE Applications Handbook will be used unless otherwise demonstrated by the manufacturer's guarantee and an equivalent long-term service contract.
    c. Refrigerant type.
    d. Refrigerant charge in pounds of refrigerant per ton of gross cooling capacity.
    e. Tested refrigerant leakage rate, in percent per year. A default rate of 2% will be used unless otherwise demonstrated by test data.
    f. Tested end-of-life refrigerant loss, in percent. A default rate of 10% will be used unless otherwise demonstrated by test data.

1.7 LEED BUILDING SUBMITTAL REQUIREMENTS:

A. The LEED BUILDING Submittal information must be assembled into one package per contract specification section(s) (or per Subcontractor), and submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES. Incomplete or inaccurate LEED BUILDING submittals may be used as the basis for the rejection of products or assemblies. Incomplete or inaccurate LEED BUILDING Submittals may be used as the basis for rejecting the submitted products or assemblies.

1.8 LEED ACTION PLANS:

A. Construction Waste Management Plan- Refer to Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL for detailed submittal requirements.

B. Construction IAQ Management Plan- Refer to Section 01 81 19 INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS for detailed submittal requirements.

C. Erosion and Sedimentation Control Plan:

1. The Plan must be in accordance with the New York State Department of Environmental Conservation (NYSDEC) or the 2003 EPA Construction General Permit, whichever is more stringent.

2. The Plan must be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEEDURES.

3. Detailed requirements: ESC Plan

a. Include the Stormwater Pollution Prevention Plan, if required.

b. Identify the party responsible for Plan monitoring and documentation. The party must be regularly on site.

c. Describe all site work that will be implemented on the project.

d. Provide site plan with location of ESC measures, including, but not limited to, stormwater quantity controls, stormwater quality controls, stabilized construction entrances, washdown areas, and inlet/catch basin protection.

e. Describe the inspection and maintenance of the ESC measures. Provide a construction schedule indicating weekly site review.

f. Describe reporting and documentation measures.

4. Detailed requirements: ESC Measures

5. Submittal requirements: ESC Tracking Log

a. Note date of major rain events, describe damage, describe any repairs or maintenance performed, and note responsible party.

b. Note date and findings of weekly site review, describe any repairs or maintenance performed, and note responsible party.

c. Submit monthly.

6. Implementation

a. The Contractor must implement the ESC Plan, coordinate the Plan with all affected trades, and designate one individual as the Erosion and Sedimentation Control Representative, who will be responsible for communicating the progress of the Plan with the Commissioner on a regular basis, and for assembling the required LEED documentation.

b. The Contractor must be responsible for the provision, maintenance, and repair of all ESC measures.

c. Demonstration. The Contractor must provide on-site instruction of proper construction practices required to prevent erosion and sedimentation.

d. Meetings. Urgent or ongoing ESC issues will be discussed at weekly on-site job meetings.

1.9 QUALITY ASSURANCE:

A. The Contractor must implement all LEED Action Plans, coordinate the Plans and LEED Building Submittals with all affected trades, and designate one individual as the Sustainable Construction Representative at no additional cost to the City of New York, who will be responsible for communicating the progress of LEED activities with the Commissioner on a regular basis, and for assembling the required LEED documentation.

B. Responsibilities of Contractor's Subcontractors: The Contractor is responsible for its Subcontractors complying with the LEED Action Plans and for providing required LEED documentation as required for the project.

C. Distribution and Compilation: The Contractor is responsible for distributing the EBMCF and any other forms or templates required for the Subcontractors to record LEED documentation. The Contractor also be responsible for collecting and compiling EBMCF information into packages as described in Section 01 33 00 SUBMITTAL PROCEDURES.

D. Meetings: Sustainable design and construction issues must be discussed at the following meetings:

1. Demolition kick-off meeting
2. Construction kick-off meeting
3. Construction kick-off meeting for LEED (independent meeting)
4. Weekly job-site progress and coordination meetings
5. Closeout meeting

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 81 13.03

ENVIRONMENTAL BUILDING MATERIALS CERTIFICATION FORM

Contractor Name: _____
Contractor Contact: _____
Telephone Number: _____

Project Name: _____
Project I.D.: _____

		Recycled Content			Regional[4]			Rapidly Renewable[7]		VOC content[8]		Flooring[9]	Wood	
Product/Manufacturer	**Material Cost**[1]	Pre-Consumer (% by wt)[2]	Post-Consumer (% by wt)[3]	Total % (½ Pre + Post)	Location & Distance to Extraction[5]	Location & Distance to Manufacture[6]	Extracted **&** Manuf. (% by wt)	Material	% by wt	*VOC content listed	*VOC content allowed	*Green Label or FloorScore	*Added urea formaldehyde (Yes/No) [10]	FSC Certified[11] (% by wt)

[1] **Material Cost:** As it appears on the manufacturer's or distributor's invoice to the Contractor or Subcontractor. Does not include labor or equipment costs associated with installation.

[2] **Pre-Consumer Recycled Content:** Industrial/manufacturing waste material (e.g., fly-ash and synthetic gypsum, both waste products from coal burning electricity plants) diverted from landfill and incorporated into a finished product. Scrap raw materials that can be reused in the same manufacturing process from which they are recovered are not considered Pre-Consumer Recycled Content.

[3] **Post-Consumer Recycled Content:** Material or product that has served its intended consumer use (e.g., an empty plastic bottle) and has been diverted from landfill and incorporated into a finished product.

[4] **Regional:** Refers to a material/product that is BOTH extracted AND manufactured within 500 miles of the Project site. Record this information ONLY for materials/products meeting BOTH of these criteria.

[5] **Extraction:** Refers to the location from which the raw resources used in a building product are extracted, harvested, or recovered.

[6] **Manufacture:** Refers to the location of the final assembly of components into a building product that is furnished and installed by the Contractor.

[7] **Rapidly Renewable:** Refers to materials/products derived from agricultural products that are typically harvested within a ten-year or shorter cycle.

[8] **VOC Content:** The quantity of volatile organic compounds contained in adhesives, sealants. paints and architectural coatings. Reported in grams/liter or lbs/gallon, less water.

[9] **Flooring:** For carpet, indicate Carpet and Rug Institute (CRI) Green Label Plus certification. For carpet cushion, indicate CRI Green Label certification. For all flooring except unfinished/untreated wood and mineral-based flooring (tile, masonry, terrazzo, cut stone) without organic-based coatings or sealants, indicate Resilient Floor Covering Institute FloorScore rating. VOC limits for adhesives, sealants, etc. still apply.

[10] **Added Urea Formaldehyde:** Applies to composite wood and agrifiber products only (plywood, particleboard, MDF, OSB, wheatboard, strawboard). Resins or binders with added urea formaldehyde are prohibited.

[11] **FSC Certified:** Certification from the Forest Stewardship Council. This column is only applicable to wood products.

***** Applies only to materials/products installed within the weather barrier.

Contractor Certification:
I, _____ a duly authorized representative of_____ (the Contractor) hereby certify that the material information contained herein is an accurate representation of the material qualifications to be provided by the Contractor as components of the final building construction. Furthermore, I understand that any change in such qualifications during the purchasing period will require prior written approval from the Commissioner.

Signature of Authorized Representative: _____ Date: _____

SECTION 01 81 13.04
SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 13.04

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. LEED BUILDING - GENERAL REQUIREMENTS**:**

The City of New York is committed to implementing good environmental practices and procedures which include achieving a LEED™ Green Building rating. Specific Project requirements related to this goal are listed in the applicable paragraphs of this section of the General Conditions. The Contractor must ensure that these requirements as defined in the sections below and in related sections of the Contract Documents, are implemented to the fullest extent. Substitutions, or other changes to the work proposed by the Contractor or their Subcontractors, will not be allowed if such changes compromise the stated LEED BUILDING criteria.

B. This Section includes:

1. Definitions
2. LEED Provisions
3. LEED Building Submittals
4. LEED Building Submittal Requirements
5. LEED Action Plan
6. VOC Requirements for Interior Adhesives and Sealants
7. VOC Requirements for Interior Paints and Coatings
8. Low-Emitting Materials, Flooring
9. Low-Emitting Materials, Composite Wood
10. Low-Emitting Materials, Ceilings, Walls, Thermals and Acoustic Insulation
11. Low-Emitting Materials, Furniture
12. Low-Emitting Materials, Exterior Applied Products
13. Low-Emitting Materials, Additional Low-Emitting Requirements

C. This Section includes requirements for Volatile Organic Compound (VOC) emissions and content in specific materials used within the Project.

D. All sections in the Project Specifications with adhesives, sealant or sealant primer applications, paints, coatings, flooring, composite wood, ceilings, walls, thermal and acoustic insulation, furniture, and for healthcare and schools, exterior applied products, must follow all requirements of this section. In the event of any conflict or inconsistency between this section and the Specifications regarding adhesives, sealant or sealant applications, paints, coatings, flooring, composite wood, ceilings, walls, thermal and acoustic insulation, furniture, and for healthcare and schools, exterior applied products, the requirements set forth in this Section will prevail.

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
B. Section 01 81 19 INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS
C. Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS
D. Section 01 91 15 GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Adhesive	Any substance used to bond one surface to another by attachment. Includes adhesive primers and adhesive bonding primers.
Aerosol Adhesive	Any adhesive packaged as an aerosol with a spray mechanism permanently housed in a non-refillable can designed for hand-held application without the need for ancillary equipment
Agrifiber Products	Products derived from recovered agricultural waste fiber from sources such as cereal straw, sugarcane bagasse, sunflower husk, walnut shells, coconut husks and agricultural prunings, processed and mixed with resins to produce panels with characteristics similar to composite wood.
Bio-based materials	Composed in whole or in significant part of biological products, renewable agricultural materials or forestry materials, and must meet the Sustainable Agriculture Network's Sustainable Agriculture Standard. Bio-based raw materials must be tested using ASTM Test Method D6866 and be legally harvested, as defined by the exporting and receiving country. Exclude hide products, such as leather and other animal skin material.
Building Exterior	A structure's primary and secondary weatherproofing system, including waterproofing membranes and air- and water-resistant barrier materials, and all building elements outside that system.
Building Interior	Everything inside a structure's weatherproofing membrane.
Carcinogen	A chemical listed as a known, probable, reasonably anticipated, or possible human carcinogen by the International Agency for Research on Cancer

	(IARC) (Groups 1, 2A, and 2B), the National Toxicology Program (NTP) (Groups 1 and 2), the U.S. Environmental Protection Agency (EPA) Integrated Risk Information System (IRIS) (weight-of-evidence classifications A, B1, B2, and C, carcinogenic, likely to be carcinogenic, and suggestive evidence of carcinogenicity or carcinogen potential), or the Occupational Safety and Health Administration (OSHA).
Certified Wood	See Forest Stewardship Council (FSC) Certified Wood.
Clear Wood Finish	Clear/semi-transparent coating applied to wood substrates to provide a transparent or translucent solid film.
Coating	Liquid, liquefiable or mastic composition that is converted to a solid adherent film after application to a substrate as a thin layer; and is used for decorating, protecting, identifying or to serve some functional purpose such as the filling or concealing of surface irregularities or the modification of light and heat radiation characteristics; and is intended for on-site application to interior or exterior surfaces of buildings. Does not include stains, clear finishes, recycled latex paint, specialty (industrial, marine or automotive) coatings or paint sold in aerosol cans.
Composite Wood	Products composed of wood or plant particles or fibers bonded by a synthetic resin or binder to produce panels such as plywood, particleboard, and medium density fiberboard (MDF). Does not include hardboard, structural panels, glued laminated timber, prefabricated wood I-joists or finger-jointed lumber.
Cradle-to-Gate Assessment	Analysis of a product's partial life cycle, from resource extraction to the factory gate, before it is transported for distribution and sale.
Design Consultant	The entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

Enclosure	The exterior plus semi-exterior portions of the building. Exterior consists of the elements of a building that separate conditioned spaces from the outside (i.e., the wall assembly). Semi-exterior consists of the elements of a building that separate conditioned space from unconditioned space or that encloses semi-heated space through which thermal energy may be transferred to or from the exterior or conditioned or unconditioned spaces (e.g., attic, crawl space, basement).
Environmental Product Declaration (EPD)	A statement that the item meets the environmental requirements of, ISO 14025, 14040 and EN 15804, or ISO 21930 and have at least a cradle-to-gate scope.
Extended Producer Responsibility	A waste management strategy, also known as closed-loop program or product take-back, where the manufacturer's responsibility for a product is extended to the post-consumer stage of the product's life-cycle.
Floor Coating	Opaque coating applied to flooring. Excludes industrial maintenance coatings.
Forest Stewardship Council (FSC) Certified Wood	Wood-based materials and products certified in accordance with the Forest Stewardship Council's principles and criteria.
Hazardous Air Pollutant	Any compound listed by the U.S. EPA in the Clean Air Act Section 112(b)(1) as a hazardous air pollutant.
Inherently Non-Emitting Materials	Products that are inherently non-emitting sources of VOCs, including stone, ceramic, powder-coated metals, plated or anodized metals, lass, concrete, clay brick, unfinished solid wood, untreated solid wood. These materials are considered compliant without VOC testing if they do not include integral organic-based surface coatings, binders or sealants.
Lacquer	Clear/semi-transparent coating formulated with cellulosic or synthetic resins to dry by evaporation without chemical reaction and provide a solid, protective film.

LEED	The Leadership in Energy & Environmental Design rating system developed by the United States Green Building Council (USGBC).
Life-Cycle Assessment	An evaluation of the environmental effects of a product from cradle to grave, as defined by ISO 14040-2006 and ISO 14044-2006.
Mutagen	A chemical that meets the criteria for category 1, chemicals known to induce heritable mutations or to be regarding as if they induce heritable mutations in the germ cells of humans, under the Harmonized System for the Classification of Chemicals Which Cause Mutations in Germ Cells (United Nations Economic Commission for Europe, Globally Harmonized System of Classification and Labeling of Chemicals).
Ozone-Depleting Compounds	A compound with an ozone-depletion potential greater than 0.1 (CFC 11=1) according to the U.S. EPA list of Class I and Class II Ozone-Depleting Substances.
Paint	A pigmented coating. For the purposes of this specification, paint primers are considered to be paints. A. Flat Coating or Paint: Has a gloss of less than 15 (using an 85-degree meter) or less than 5 (using a 60-degree meter). B. Non-Flat Coating or Paint: Has a gloss of greater than or equal to 15 (using an 85-degree meter) or greater than or equal to 5 (using a 60-degree meter). C. Non-Flat High-Gloss Coating or Paint: Has a gloss of greater than or equal to 70 (using a 60-degree meter). Anti-Corrosive / Rust Preventative Paint: Coating formulated and recommended for use in preventing the corrosion of ferrous metal substrates.
Permanently Installed Building Product	See Product.
Primer	Coating that is formulated and recommended for one or more of the following purposes: to provide a firm bond between the substrate and a subsequent coating; to prevent a subsequent coating from being absorbed into the substrate; to prevent harm to a subsequent coating from materials in the

	substrate; or to provide a smooth surface for application of a subsequent coating.
Product	An item that arrives on the Project site either as a finished element ready for installation or as a component to another item assembled on-site. The product unit is defined by the functional requirement for use in the Project; this includes the physical components and services needed to serve the intended function of the permanently installed building product. Similar products within a specification will each contribute as a separate product.
Product-Specific Declaration	Products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that have at least a cradle-to-gate scope.
Recycled Content	The percentage by weight of constituents that have been recovered or otherwise diverted from the solid waste stream, either during the manufacturing process (pre-consumer) or after consumer use (post-consumer). Recycled content claims for products must conform to the definition in ISO 14021-1999, Environmental Labels and Declarations, Self-Declared Environmental Claims (Type II Environmental Labeling). Spills and scraps from the original manufacturing process that are combined with other constituents after a minimal amount of reprocessing for use in further production of the same product are not recycled materials. Discarded materials from one manufacturing process that are used as constituents in another manufacturing process are pre-consumer recycled materials. “Pre-consumer” may also be referred to as “post-industrial”.

Regionally Manufactured Materials	Materials that are manufactured, distributed and purchased within a radius of 100 miles from the Project location. Manufacturing refers to all points of manufacture for an assembly of components.
Regionally Extracted, Harvested, or Recovered Materials	Materials which are extracted, harvested or recovered, manufactured, distributed and purchased within a radius of 100 miles from the Project site.
Reproductive Toxin	A chemical listed as a reproductive toxin (including developmental, female, and male toxins) by the State of California under the Safe Drinking Water and Toxic Enforcement Act of 1986 (California Code of Regulations, Title 22, Division 2, Subdivision 1, Chapter 3, Sections 1200, et. Seq.).
Sanding Sealer	Clear/semi-transparent coating formulated to seal bare wood. Can be abraded to create a smooth surface for subsequent coatings. Does not include sanding sealers that are lacquers (see Clear Wood Finish above).
Sealant	Any material with adhesive properties, formulated primarily to fill, seal, or waterproof gaps or joints between surfaces. Includes sealant primers and caulks.
Shellac	Clear or pigmented coating formulated solely with the resinous secretions of the lac beetle, thinned with alcohol and formulated to dry by evaporation without chemical reaction. Excludes floor applications.
Solar Reflectance Index (SRI)	A measure of a material's ability to reflect solar heat, as shown by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is equal to 0, and a standard white (reflectance 0.80, emittance of 0.90) is equal to 100.
Stain	Clear semi-transparent/opaque coating formulated to change the color but not conceal the grain pattern or texture of the substrate.
Varnish	Clear/semi-transparent coating, excluding lacquers and shellacs, formulated to dry by chemical reaction on exposure to air. May contain small amounts of pigment.

Volatile Aromatic Compound	Any hydrocarbon compound containing one or more 6-carbone benzene rings, and having an initial boiling point less than or equal to 280 degrees Celsius measured at standard conditions of temperature and pressure.
Volatile Organic Compound (VOC)	Any compound of carbon (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate) which vaporizes (becomes a gas) and participates in atmospheric photochemical reactions, as specified in Part 51.00 of Chapter 40 of the U.S. Code of Federal Regulations, at normal room temperatures. For the purposes of this specification, formaldehyde and acetaldehyde are considered to be VOCs.Waterproofing Sealer: A coating that prevents the penetration of water into porous substrates.

1.5 LEED PROVISIONS:

A. Refer to the Addendum for the LEED rating to be achieved for this Project. The provisions to achieve this LEED rating are integrated within the Project construction documents and specifications. Additional LEED requirements are met through aspects of the Project design, including material and equipment selections, which may not be specifically identified as LEED Building requirements. Compliance with the requirements needed to obtain LEED prerequisites and credits will be used as one criterion to evaluate substitution requests.

1.**6 LEED BUILDING SUBMITTALS:**

A. Scope: LEED Building Submittals are required for all permanently installed materials included in General Construction work. For Plumbing, Mechanical and Electrical work, LEED Building Submittals are only required for field-applied adhesives, sealants, paints and coatings. Voluntary inclusion of system components such as piping, pipe insulation, ducts, conduits, plumbing fixtures, faucets and lamp housings must be consistently applied to the Project's LEED credits. Submit all required LEED Building Submittals in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

B. Applicability: The extent of the LEED Building Submittals varies depending on the specification section. Applicable LEED Building Submittals are listed under the "LEED Building Submittals" heading in each specification section. The detailed requirements for the LEED Building Submittals are defined in Sub-Section 1.6 C below.

C. Detailed Requirements: Sub-Sections 1.6 C.1 through 1.6 C.18 below define the information and documents to be submitted for each type of LEED Building Submittal as identified in the LEED Building Submittals heading in each specification section:

1. LEED v4 Material and Resources (MR) Credits Calculator for Building Product Disclosure and Optimization (Disclosure and Optimization Calculator): With each submittal of a product permanently installed in the Project, the Contractor is responsible for the completion of the

Disclosure and Optimization Calculator, which can be found on USGBC's website. The Contractor must maintain an updated Disclosure and Optimization Calculator for all applicable products throughout the Project duration and submit the updated calculator on a monthly basis.

a. The Disclosure and Optimization Calculator will record the information outlined in Items b.-c. below for all permanently installed products, the information outlined in Item d. below for all permanently installed concrete mixes, and the information outlined in Items e.-i. below for all permanently installed products that have the content, disclosure or optimization characteristics described herein:

b. Cost breakdowns for the materials included in the Contractor or Subcontractor's scope of work. Cost reporting must include itemized material costs (excluding the Contractor's labor, equipment, overhead and profit).

c. The percentages (by weight) of post-consumer and/or post-industrial recycled content in the supplied product(s).
   1) For each product with recycled content, also indicate the total recycled content value (1/2 x pre-consumer percentage x product value + 1 x post-consumer percentage x product value = total recycled content value).
   2) See additional requirements for concrete in section 1.6.C.1.d below.

d. The percentage (by weight), relative to the total weight of cementitious materials, of supplementary cementitious materials or pozzolans such as fly ash used in each concrete mix used in the Project.
   1) For each concrete mix, submit a complete breakdown of all components, by weight and by cost.

e. Identification (Yes/No) of materials manufactured, distributed and purchased within 100 miles of the Project site AND containing raw materials harvested or extracted within 100 miles of the Project site, if used in the Project, as well as the following information:
   1) Indicate the percentage by weight, relative to the total weight of the product that meets these criteria.
   2) Indicate the point of harvest/extraction/recovery of regional raw materials, the point of final assembly of regional manufactured products, and the distance from each point to the Project site.

f. The percentage (by cost) of "Forest Stewardship Council (FSC) Certified" wood products, if used in the Project.
   1) Record all new wood products, indicating which are FSC-certified. Do not record reclaimed, salvaged, or recycled FSC-certified wood products.
   2) Reclaimed, salvaged, or recycled FSC-certified wood may be recorded as post-consumer recycled content.

g. The number or percentage of products with Environmental Product Declarations (EPD), with fractional or multiplied values as indicated below. If a product used in the Project has an EPD Declaration, submit one of the following:
   1) EPD:
      i. Product-Specific Declaration: Valued as one quarter (1/4) of a product
      ii. Industry-Wide (Generic) EPD: Valued as one half (1/2) of a product
      iii. Product-Specific Type III EPD: Valued as one whole product
   2) Documentation of third-party certification of impact reduction below industry average for at least three of the following categories, valued at 100%:
      i. Global warming potential (greenhouse gases), in CO_2e;
      ii. Depletion of the stratospheric ozone layer, in kg CFC-11;
      iii. Acidification of land and water sources, in moles H+ or kg SO_2;
      iv. Eutrophication, in kg nitrogen or kg phosphate;
      v. Formation of tropospheric ozone, in kg NOx or kg ethene; and depletion of nonrenewable energy resources, in MJ.

3) For 1) and 2) above, if a product is also sourced (extracted, manufactured, purchased) within 100 miles of the site, it is valued as two times the whole product.

4) For 1) and 2) above, structure and enclosure materials may not constitute more than 30% of the value of compliant building products.

h. The number or percentage of products for which Sourcing of Raw Materials has been documented, with fractional or multiplied values as indicated below. If a product used in the Project has documented Sourcing of Raw Materials, submit one of the following:

1) Corporate sustainability report (CSR). Submit one of the following:
   i. Manufacturer's self-declared report: valued as half of a product
   ii. Third-party verified CSR which include environmental impacts of extraction operations and activities associated with the manufacturer's product and the product's supply chain: valued as one whole product:
      1. Global Reporting Initiative (GRI) Sustainability Report
      2. Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises
      3. U.N. Global Compact: Communication of Progress
      4. ISO 26000: 2010 Guidance on Social Responsibility
      5. Other USGBC approved programs meeting the CSR criteria

2) Documentation of at least one of the responsible extraction criteria below:
   i. Extended producer responsibility program, valued as half of a product
   ii. Bio-based materials, valued as one whole product
   iii. Certified Wood: Wood-based materials include all materials made from wood, including engineered wood products and wood-based panel products, valued as one whole product
   iv. Material Reuse: Materials may be salvaged, refurbished, or reused, valued as one whole product.
   v. Recycled content. The sum of post-consumer recycled content plus one-half the pre-consumer recycled content, based on cost, valued as one whole product.
   vi. Other USGBC approved programs meeting leadership extraction criteria

3) For 1) and 2) above, if a product is also sourced (extracted, manufactured, purchased) within 100 miles of the site: valued as two times the whole product.

4) For 1) and 2) above, structure and enclosure materials may not constitute more than 30% of the value of compliant building products. Products meeting multiple criteria may only be counted once.

i. The number or percentage of products for which Material Ingredients have been disclosed, with fractional or multiplied values as indicated below. If a product used in the Project discloses its Material Ingredients, submit one of the following:

1) Chemical inventory of the product to at least 0.1% (1000 ppm), documented by one of the following:
   i. Manufacturer Inventory
   ii. Health Product Declarations (HPDs)
   iii. Cradle to Cradle (C2C) certifications
   iv. Declare product labels
   v. ANSI/BIFMA e3 Furniture Sustainability Standard (Furniture may be included, providing it is included consistently in all MR Credits.)

2) Documentation of compliance with one of the following material ingredient optimization criteria programs:
   i. GreenScreen benchmarks
   ii. Cradle to Cradle certifications
   iii. REACH optimizations
   iv. Other USGBC approved programs meeting building product optimization criteria

3) Documentation that the product is sourced from a manufacturer that meets all of the below supply chain optimization criteria:
   i. Manufacturer engages in validated and robust safety, health, hazard and risk programs which at a minimum document at least 99% (by weight) of the ingredients used to make the building product or building material
   ii. Manufacturer provides independent third party verification of the following conditions for their supply chain, at a minimum:
      1. Processes are in place to communicate and transparently prioritize chemical ingredients along the supply chain according to available hazard, exposure and use information to identify those that require more detailed evaluation
      2. Processes are in place to identify, document, and communicate information on health, safety and environmental characteristics of chemical ingredients
      3. Processes are in place to implement measures to manage the health, safety and environmental hazard and risk of chemical ingredients
      4. Processes are in place to optimize health, safety and environmental impacts when designing and improving chemical ingredients
      5. Processes are in place to communicate, receive and evaluate chemical ingredient safety and stewardship information along the supply chain
      6. Safety and stewardship information about the chemical ingredients is publicly available from all points along the supply chain

4) For 2) and 3) above, if a product is also sourced (extracted, manufactured, purchased) within 100 miles of the site: valued as two times the whole product. Products compliant with both 2) and 3) may only be counted once.

5) For 1), 2), and 3) above, structure and enclosure materials may not constitute more than 30% of the value of compliant building products.

2. LEED v4 Indoor Environmental Quality Credit Low-Emitting Materials Calculator (EQ Calculator). With each relevant product submittal, the Contractor is responsible for the completion of the EQ Calculator, which can be found on USGBC's website. The Contractor must maintain an updated EQ Calculator throughout the Project duration for all applicable products and submit the updated calculator on a monthly basis.

   a. The EQ Calculator must record information for all relevant products as outlined below. Include the following documentation. Detailed requirements are listed in b. – j. below.
      1) Volume used of all field applied interior adhesives, sealants, paints & coatings.
      2) VOC content of all field-applied interior adhesives, sealants, paints, and coatings, listed in grams/liter or lbs./gallon, less water.
      3) General Emissions Evaluation for more than 90 percent of all field-applied interior paints, coatings, adhesives, and sealants, by volume, and for 100 percent of all flooring, ceilings, walls, and thermal and acoustic insulation.
      4) Composite Wood Evaluation for all composite wood not covered by other categories.
      5) Furniture Evaluation for 90% of all furniture, by cost.

6) For schools/healthcare only: Exterior-Applied Products Evaluation for 90% of all exterior applied materials, measured by volume. All batt insulation products must contain no added formaldehyde.

b. VOC REQUIREMENTS, GENERAL: The following materials must meet the listed compliance requirements for emissions and content standards, for all applicable categories. All products must comply with each applicable threshold requirement. Refer to LEED BD+C Reference Guide, EQ Credit Low-Emitting Materials for additional guidance.

1) General Emissions Requirements: Products must demonstrate they have been tested and determined compliant in accordance with California Department of Public Health (CDPH), Standard Method v1.1-2010 or v1.2-2017, using the applicable exposure scenario, and stating the range of total VOCs (TVOC) after 14 days measured as specified in the CDPH Standard Method v1.1 as follows:
   i. 0.5mg/m3 or less;
   ii. between 0.5 and 5.0 mg/m3; or,
   iii. 0.50 mg/m3 or more
2) No product may contain any ingredients that are carcinogens, mutagens, reproductive toxins, persistent bioacculmulative compounds, hazardous air pollutants, or ozone-depleting compounds. An exception will be made for titanium dioxide and, for products that are pre-tinted by the manufacturer, carbon black, which must be less than or equal to 1% by weight of the product.
3) No product may contain the following:
   i. methylene chloride
   ii. 1,1,1-trichloroethane
   iii. benzene
   iv. toluene
   v. ethylbenzene
   vi. vinyl chloride
   vii. naphthalene
   viii. 1,2-dichlorobenzene
   ix. di (2-ethylhexyl) phthalate
   x. butyl benzyl phthalate
   xi. di-n-butyl phthalate
   xii. di-n-octyl phthalate
   xiii. diethyl phthalate
   xiv. dimethyl phthalate
   xv. isophorone
   xvi. antimony
   xvii. cadmium
   xviii. hexavalent chromium
   xix. lead
   xx. mercury
   xxi. formaldehyde
   xxii. methyl ethyl ketone
   xxiii. methyl isobutyl ketone
   xxiv. acrolein
   xxv. acrylonitrile
4) No product may contain more than 1.0% by weight of sum total of volatile aromatic compounds.

c. VOC REQUIREMENTS FOR INTERIOR ADHESIVES AND SEALANTS:

1) For field applications that are inside the weatherproofing system, use adhesives and sealants that comply with the following limits for VOC content when calculated

according to South Coast Air Quality Management District (SCAQMD) Rule #1168 requirements in effect on July 1, 2005, and rule amendment date January 7, 2005:

	Allowable VOC Content (g/L):
Architectural Applications:	
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesives	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Dry wall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single ply roof membrane adhesives	250
Specialty Applications:	
PVC welding	510
CPVC welding	490
ABS welding	325
Plastic cement welding	250
Adhesive primer for plastic	550
Computer diskette manufacturing	350
Contact adhesive	80
Special purpose contact adhesive	250
Tire retread	100
Adhesive primer for traffic marking tape	150
Structural wood member adhesive	140
Sheet applied rubber lining operations specialty	850
Top and Trim adhesive	250
Substrate Specific Applications:	
Metal to metal substrate specific adhesives	30
Plastic foam substrate specific adhesives	50
Porous material (except wood) substrate specific adhesives	50
Wood substrate specific adhesives	30
Fiberglass substrate specific adhesives	80
Sealants:	
Architectural sealant	250
Marine deck sealant	760
Nonmember roof sealant	300
Roadway sealant	250
Single-ply roof membrane sealant	450
Other sealant	420
Sealant Primers:	
Architectural non-porous sealant primer	250
Architectural porous sealant primer	775

Modified bituminous sealant primer	500
Marine deck sealant primer	760
Other sealant primer	750
Other	
Other adhesives, adhesive bonding primers, adhesive primers or any other primers	250

2) For field applications that are inside the weatherproofing system, a minimum of 90 percent of adhesives and sealants, by volume, must comply with the requirements of the CDPH "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

d. VOC REQUIREMENTS FOR INTERIOR PAINTS AND COATINGS:

1) For field applications that are inside the weatherproofing system, use paints and coatings that comply with the following limits for VOC content when calculated according to the California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the SCAQMD Rule #1113, effective June 3, 2011.

Product Type:	Allowable VOC Content (g/L):
Bond Breaker	350
Clear wood finishes - Varnish	275
Clear wood finishes – Sanding Sealer	275
Clear wood finishes - Lacquer	275
Colorant – Architectural Coatings, excluding IM coatings	50
Colorant – Solvent Based IM	600
Colorant - Waterborne IM	50
Concrete – Curing compounds	100
Concrete – Curing compounds for roadways & bridges	350
Concrete surface retarder	50
Driveway Sealer	50
Dry-fog coatings	50
Faux finishing coatings - Clear topcoat	100
Faux finishing coatings – Decorative Coatings	350
Faux finishing coatings - Glazes	350
Faux finishing coatings - Japan	350
Faux finishing coatings – Trowel applied coatings	50
Fire-proof coatings	150
Flats	50
Floor coatings	50
Form release compounds	100
Graphic arts (sign) coatings	150
Industrial maintenance coatings	100
Industrial maintenance coatings – High temperature IM coatings	420
Industrial maintenance coatings – Non-sacrificial anti-graffiti coatings	100
Industrial maintenance coatings – Zinc rich IM primers	100

Magnesite cement coatings	450
Mastic coatings	100
Metallic pigmented coatings	150
Multi-color coatings	250
Non-flat coatings	50
Pre-treatment wash primers	420
Primers, sealers and undercoaters	100
Reactive penetrating sealers	350
Recycled coatings	250
Roof coatings	50
Roof coatings, aluminum	100
Roof primers, bituminous	350
Rust preventative coatings	100
Stone consolidant	450
Sacrificial anti-graffiti coatings	50
Shellac- Clear	730
Shellac – Pigmented	550
Specialty primers	100
Stains	100
Stains, interior	250
Swimming pool coatings – repair	340
Swimming pool coatings – other	340
Traffic Coatings	100
Waterproofing sealers	100
Waterproofing concrete/masonry sealers	100
Wood preservatives	350
Low solids coatings	120

2) For field applications that are inside the weatherproofing system, 90 percent of paints and coatings must comply with the requirements of the CDPH's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

e. LOW-EMITTING MATERIALS, FLOORING: Flooring must comply with the requirements of the CDPH's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

f. LOW-EMITTING MATERIALS, COMPOSITE WOOD: Composite wood, agrifiber products, and adhesives must be made using ultra-low-emitting formaldehyde (ULEF) resins as defined in the CARB's "Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products" or must be made with no added formaldehyde.

g. LOW-EMITTING MATERIALS, CEILINGS, WALLS, THERMAL, AND ACOUSTIC INSULATION: Ceilings, walls, and thermal and acoustic insulation must comply with the requirements of the CDPH's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

h. LOW-EMITTING MATERIALS, FURNITURE: At least 90 percent of furniture, measured by cost, will be tested in accordance with ANSI/BIFMA Standard Method M7.1-2011; comply with ANSI/BIFMA e3-2011 Furniture Sustainability Standard, Sections 7.6.1 and 7.6.2, using either the concentration modeling approach or the emissions factor approach; and model the test results using the open plan, private office, or seating scenario in ANSI/BIFMA M7.1, as appropriate.

i. LOW-EMITTING MATERIALS, EXTERIOR APPLIED MATERIALS (HEALTHCARE/ SCHOOLS ONLY): At least 90 percent of exterior applied materials, measured by volume,

must comply with the requirements of the CDPH's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

1) The following materials are prohibited and do not count toward total percentage compliance:
   a) Hot-mopped asphalt for roofing.
   b) Coal tar sealants for parking lots and other paved surfaces.

j. LOW-EMITTING MATERIALS, ADDITIONAL LOW-EMITTING REQUIREMENTS: If the applicable regulation requires subtraction of exempt compounds, any content of intentionally added exempt compounds larger than 1% weight by mass (total exempt compounds) must be disclosed.

1) If a product cannot reasonably be tested as specified above, testing of VOC content must comply with ASTM D2369-10; ISO 11890, part 1; ASTM D6886-03; or ISO 11890-2.

2) Methylene chloride and perchloroethylene may not be intentionally added in adhesives, sealants, paints or coatings.

3. BACK-UP DOCUMENTATION: For each material listed in the Disclosure and Optimization Calculator or the EQ Calculator, provide and submit in accordance with Section 01 33 00 SUBMITTAL PROCEDURES, including but not limited to the documentation to certify the material's LEED Building attributes, as applicable:

a. INSTALLATION ON LOCATION: Submit indication of the installation location of products other than adhesives, sealants, paints and coatings. Installation locations should be categorized as one of the following:
   1) Ceiling
   2) Wall
   3) Floor
   4) Subfloor
   5) Built-In Cabinetry
   6) Free-Standing Cabinetry
   7) Vertical Structural Elements
   8) Overhead Structural Elements

b. RECYCLED CONTENT: Submit published product literature or letter of certification on the manufacturer's letterhead certifying the amounts of post-consumer and/or post-industrial content.

c. REGIONAL SOURCING (WITHIN 100 MILES): Submit published product literature or letter of certification on the manufacturer's letterhead indicating the city/state where the manufacturing plant is located, where each of the raw materials in the product were extracted, harvested or recovered, manufactured, distributed and the distance in miles from the Project site.
   1) If only some of the raw materials for a particular product or assembly originate within 100 miles of the Project site, provide the percentage (by weight) that these materials comprise in the complete product.

d. BUILDING PRODUCT DISCLOSURE AND OPTIMIZATION: Submit published third-party or manufacturer's product literature or letter of certification, on the third-party or manufacturer's letterhead, certifying the documented disclosure and optimization information.

e. VOC EMISSIONS AND CONTENT: Submit Material Safety Data Sheets (MSDS), for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings, flooring, composite wood, ceilings, walls, thermal and acoustic insulation, furniture, and for healthcare and schools, exterior applied products. MSDS must

indicate the VOC emissions and content of products submitted. (If an MSDS does not include a product's VOC emissions and content, then product data sheets, manufacturer literature, or a letter of certification from the manufacturer must be submitted in addition to the MSDS to indicate the VOC emissions and content). Submit product third-party certificates and test reports, stating the testing methodology and the model, to include units that are consistent with those required. For wet-applied products, the manufacturer's documentation must state each product's classification and application according to the referenced standard's definition.

4. PRODUCT CUT SHEETS: Submit product cut sheets with the Contractor's or sub-contractor's stamp, confirming that the submitted products are the products installed in the Project.

5. FSC-CERTIFIED WOOD: If FSC-Certified Wood is used in the Project, submit:
   a. Copies of vendor's invoices itemizing all new wood purchases, showing the cost for each line item.
   b. For FSC-certified products, the vendor invoice must list product's FSC content percent and its Chain-of-Custody (CoC) certification number.
   c. For FSC-certified products, submit the product and producer's CoC certificates.
   d. For FSC-certified products modified on-site, submit on-site installer's CoC certification.
   e. For assemblies, submit the percentage (by cost and by weight) of the assembly that is FSC-certified wood and published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the percentage that is FSC-certified wood.

6. HIGH ALBEDO PAVING AND WALKWAY MATERIALS: For paving and walkway materials made from concrete or brick, submit published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying a minimum 3-year aged Solar Reflectance (SR) value of 0.28. If 3-year aged value information is not available, submit published product literature or letter verifying an initial SR value of at least 0.33 at installation.

7. HIGH ALBEDO ROOFING MATERIALS: For exposed roofing membranes, pavers, and ballast products, submit published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the following minimum Solar Reflectance Index (SRI) values, calculated according to ASTM E 1980. Reflectance will be measured according to ASTM E 903, ASTM E 1918, or ASTM C 1549. Emittance will be measured according to ASTM E 408 or ASTM C 1371. Vegetated roof surfaces are exempt from the SRI criteria.

   a. 82 for initial SRI, or 64 for 3-year aged SRI for low-sloped roofing applications (slope ≤ 2:12)
   b. 39 for initial SRI or 32 for 3-year aged SRI for steep-sloped roofing applications (slope > 2:12)

8. LOW MERCURY LAMPS: For all fluorescent, compact fluorescent and HID lamps installed in the Project, submit the total number of each lamp type and submit published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the following information. Preheat, T-9, T-10 and T-12 fluorescents or mercury vapor high-intensity discharge (HID) lamps must not be installed in the Project. For healthcare projects only, probe-start metal halide HID lamps must not be installed in any interior spaces.

   a. The mercury content or content range per lamp in milligrams or picograms, meeting the following criteria;

Lamp	Maximum Mercury Content (milligram)
T-8 fluorescent, eight-foot	10 mg
T-8 fluorescent, four-foot	3.5 mg
T-8 fluorescent, U-bent	6 mg
T-5 fluorescent, linear	2.5 mg
T-5 fluorescent, circular	9 mg
Compact fluorescent, nonintegral ballast	3.5 mg
Compact fluorescent, integral ballast	3.5 mg, ENERGY STAR qualified

High-pressure sodium, up to 400 watts	10 mg
High-pressure sodium, above 400 watts	32 mg

b. The design light output per lamp (light at 40% of a lamp's useful life) in lumens; and
c. The rated average life of the lamp in hours.

9. EXIT SIGNS: Illuminated exit signs must not contain mercury, and must use less than 5 watts of electricity.

10. CONCRETE: Submit concrete mix design for each mix, designated by a distinct identifying code or number and signed by a Professional Engineer licensed in the state of New York.

11. INTERIOR LIGHTING FIXTURES: For each lighting fixture type installed within the building's weather barrier, submit manufacturer's cut sheets indicating the following:

    a. Fixture power in watts.
    b. Initial lamp lumens.
    c. Photometric distribution data.
    d. Dimming capability, in range of percentages.

12. EXTERIOR LIGHTING FIXTURES: For each lighting fixture type installed on site, submit manufacturer's cut sheets indicating the following:

    a. Fixture power in watts.
    b. Initial lamp lumens.
    c. Photometric distribution data.
    d. Range of field adjustability, if any.
    e. Warranty of suitability for exterior use.

13. ALTERNATIVE TRANSPORTATION: Submit manufacturer's cut sheets and/or shop drawings for the following items installed on site:

    a. Bike racks, including total number of bicycle slots provided.
    b. Signage indicating parking spaces reserved for electric or low-emitting vehicles and for carpools/vanpools, including total number of signs.

14. WATER CONSERVING FIXTURES: For all water consuming plumbing fixtures and fittings, submit manufacturer's cut sheets showing maximum flow rates and/or flush rates.

15. ENERGY SAVING APPLIANCES: Submit manufacturer's cut sheets and published product literature or letter from the manufacturer (on the manufacturer's letterhead) verifying the product's rating under the U.S. EPA/DOE Energy Star program, for all of the following:

    a. Appliances (i.e., refrigerators, dishwashers, microwave ovens, televisions, clothes washers, clothes dryers, chilled water dispensers).
    b. Office equipment (i.e., copy machines, fax machines, plotters/printers, scanners, binding and publishing equipment).
    c. Electronics (i.e., servers, desktop computers, computer monitor displays, laptop computers, network equipment).
    d. Commercial food service equipment.

16. GLAZING: For glazing in any windows, doors, storefront and window wall systems, curtainwall systems, skylights, and partitions, submit manufacturer's cut sheets indicating the following:

    a. Glazed area.
    b. Visible light transmittance.
    c. Solar heat gain coefficient.
    d. Fenestration assembly u-factor.

17. VENTILATION: Submit manufacturer's cut sheets for the following:
    a. Carbon dioxide monitoring systems, if any, installed to measure outside air delivery.
    b. Air filters: for detailed requirements refer to Section 01 81 19 INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS.
18. REFRIGERATION: For all refrigeration equipment, submit manufacturer's cut sheets indicating the following:
    a. Equipment type.
    b. Equipment life. Default values specified by the 2007 ASHRAE Applications Handbook will be used unless otherwise demonstrated by the manufacturer's guarantee and an equivalent long-term service contract.
    c. Refrigerant type.
    d. Refrigerant charge in pounds of refrigerant per ton of gross cooling capacity.
    e. Tested refrigerant leakage rate, in percent per year. A default rate of 2% will be used unless otherwise demonstrated by test data.
    f. Tested end-of-life refrigerant loss, in percent. A default rate of 10% will be used unless otherwise demonstrated by test data.

1.7 LEED BUILDING SUBMITTAL REQUIREMENTS:

A. The LEED Building Submittal information must be assembled into one package per contract specification section(s) (or per Subcontractor), and submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES. Incomplete or inaccurate LEED Building Submittals may be used as the basis for the rejection of products or assemblies.

B. All final LEED Building Submittal information with back-up documentation must be submitted within two (2) months of the Project's substantial completion. If in the Project's LEED review, the USGBC or their third party reviewer requires additional documentation as it relates to the LEED Building Submittals, the Contractor must provide the requested documentation within two (2) weeks.

1.8 LEED ACTION PLANS:

A. Construction Waste Management Plan- Refer to Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL for detailed requirements.

B. Construction IAQ Management Plan- Refer to Section 01 81 19 INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS for detailed requirements.

C. Erosion and Sedimentation Control (ESC) Plan:
    1. The Plan must be in accordance with the New York State Department of Environmental Conservation (NYSDEC)'s New York State Standards and Specifications for Erosion and Sediment Control (Blue Book) or the 2012 EPA Construction General Permit, whichever is more stringent.
    2. The Plan must be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.
    3. Detailed requirements: ESC Plan
        a. Include the Stormwater Pollution Prevention Plan, if required.
        b. Identify the party responsible for Plan monitoring and documentation. The party must be regularly on site.
        c. Describe all site work that will be implemented on the Project and include timing of implementation.

d. Submit site plan with location of ESC measures, including, but not limited to, stormwater quantity controls, stormwater quality controls, stabilized construction entrances, washdown areas, inlet/catch basin protection and perimeter controls.
e. Establish and clearly delineate construction buffer zones to avoid soil compaction and other construction damage to greenfields.
f. Describe the inspection and maintenance protocols of the ESC measures. Submit a construction schedule indicating weekly site review.
g. Describe reporting and documentation measures.

4. Detailed requirements: ESC Tracking Log
   a. Note date of major rain events, describe damage, describe any repairs or maintenance of specific control measures performed, and note responsible party.
   b. Note date and findings of weekly site review, describe any repairs or maintenance performed, and note responsible party. Submit date-stamped photographs, inspection reports or other recording processes.
   c. Submit monthly.
5. Implementation
   a. Before Demolition and/or Construction begins, the Contractor will implement the ESC Plan, coordinate the Plan with all affected trades, and designate one individual as the Erosion and Sedimentation Control Representative, who will be responsible for communicating the progress of the Plan with the Commissioner monthly, and for assembling the required LEED documentation.
   b. The Contractor is responsible for the provision, maintenance, and repair of all ESC measures. Any problems identified in site inspections must be resolved in a timely manner.
   c. Demonstration. The Contractor must provide on-site instruction of proper construction practices required to prevent erosion and sedimentation.
   d. All Subcontractors must promptly notify the ESC Representative if damage to an ESC measure is observed.
   e. Meetings. Urgent or ongoing ESC issues must be discussed at weekly on-site job meetings.
6. All projects, including zero lot line buildings and projects that cause minimal or even no exterior site disturbance, must have ESC Plan that meets requirements.
7. Contractor must save such original documents for the life of the Project plus seven (7) years.

1.9 QUALITY ASSURANCE:

A. The Contractor must implement all LEED Action Plans, coordinate the Plans and LEED Building Submittals with all affected trades, and designate one individual as the Sustainable Construction Representative at no additional cost to the City of New York, who will be responsible for communicating the progress of LEED activities with the Commissioner monthly, and for assembling the required LEED documentation. The Contractor must facilitate measurements taken by authorized parties on site for LEED compliance verification purposes.

B. Responsibilities of Contractor's Subcontractors: The Contractor is responsible for the Subcontractors complying with the LEED Action Plans and for providing required LEED documentation as required for the Project.

C. Distribution and Compilation: The Contractor is responsible for distributing the LEED v4 MR Credits Calculator for Building Product Disclosure and Optimization, the LEED v4 EQ Credit Low-Emitting Materials Calculator, and any other forms or templates required for the Subcontractors to record LEED documentation. The Contractor is also responsible for collecting and compiling Building Product Disclosure and Optimization and Low-Emitting Materials information into packages as described in Section 01 33 00 SUBMITTAL PROCEDURES.

D. Meetings: Sustainable design and construction issues must be discussed at the following meetings in accordance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION:
   1. Demolition kick-off meeting

2. Construction kick-off meeting
3. Construction kick-off meeting for LEED (independent meeting)
4. Weekly job-site progress and coordination meetings
5. Closeout meeting

1.10 REFERENCES:

A. New York State Standards and Specifications for Erosion and Sediment Control, amended November 2016: http://www.dec.ny.gov/docs/water_pdf/2016nysstanec.pdf

B. 2012 EPA Construction General Permit: https://www.epa.gov/npdes/epas-2012-construction-general-permit-cgp-and-related-documents

C. South Coast Air Quality Management District (SCAQMD), Rule 1168: www.aqmd.gov

D. South Coast Air Quality Management District (SCAQMD), Rule 1113: www.aqmd.gov

E. CDPH Standard Method v1.1-2010: www.cal-iaq.org

F. ISO 17025: www.iso.org

G. ISO Guide 65: www.iso.org

H. CARB 93120 ATCM: arb.ca.gov/toxics/compwood/compwood.htm

I. ANSI/BIFMA M7.1 Standard Test Method for Determining VOC Emissions from Office Furniture Systems, Components and Seating: bifma.org

J. ANSI/BIFMA e3-2011 Furniture Sustainability Standard: bifma.org

K. ISO 14021–1999, Environmental labels and declarations—Self Declared Claims (Type II Environmental Labeling): www.iso.org

L. ISO 14025–2006, Environmental labels and declarations (Type III Environmental Labeling): www.iso.org

M. ISO 14040–2006, Environmental management, Life cycle assessment principles, and frameworks: www.iso.org

N. ISO 14044–2006, Environmental management, Life cycle assessment requirements, and guidelines: www.iso.org

O. International Standard ISO 21930–2007 Sustainability in building construction—Environmental declaration of building products: www.iso.org

P. Federal Trade Commission, Guides for the Use of Environmental Marketing Claims, 16 CFR 260.7 (e): www.ftc.gov/bcp/grnrule/guides980427.htm

Q. Global Reporting Initiative (GRI) Sustainability Report: www.globalreporting.org/

R. Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises: www.oecd.org/daf/internationalinvestment/guidelinesformultinationalenterprises/

S. U.N. Global Compact, Communication on Progress: www.unglobalcompact.org/participation/report/cop

T. ISO 26000—2010 Guidance on Social Responsibility: www.iso.org/iso/home/standards/iso26000.htm

U. Forest Stewardship Council: www.ic.fsc.org

V. Sustainable Agriculture Network: www.sanstandards.org

W. The Rainforest Alliance: www.rainforest-alliance.org/

X. ASTM Test Method D6866: www.astm.org/Standards/D6866.htm

Y. Chemical Abstracts Service: www.cas.org/

Z. Health Product Declaration: www.hpd-collaborative.org/

AA. Cradle-to-Cradle CertifiedCM Product Standard: www.c2ccertified.org/product_certification

BB. Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH): www.echa.europa.eu/support/guidance-on-reach-and-clp-implementation

CC. GreenScreen: www.greenscreenchemicals.org/method/greenscreen-list-translator

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 81 13.04

SECTION 01 81 13.10
ENVIRONMENTALLY PREFERABLE PURCHASING (EPP) COMPLIANCE

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 13.10

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes administrative and procedural requirements for all equipment, material and product purchasing to comply with the requirements of New York City Environmentally Preferable Purchasing (EPP) "Minimum Standards for Construction Products", as established by the Mayor's Office of Contract Services (MOCS). Refer to their website for further guidance.

B. All sections in the Project Specifications with applicable equipment, materials and products will follow all requirements of this section. In the event of any conflict or inconsistency between this section and the Specifications, the more stringent requirements will prevail.

C. This Section includes:

1. Definitions
2. Administrative Requirements
3. Action Submittals
4. Informational Submittals
5. Products, Materials

1.3 RELATED SECTIONS: Include without limitation the following:

A. Section 01 10 00 SUMMARY
B. Section 01 33 00 SUBMITTAL PROCEDURES
C. Section 01 78 39 CONTRACT RECORD DOCUMENTS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Term	Definition
Environmentally Preferable Purchasing (EPP) Minimum Standards for Construction Products	The standard that refers to a list of equipment, materials and products that may be specified in construction contracts covered by the EPP laws and provides the applicable minimum standards referenced in the laws. See EPP Minimum Standards for Constructions Products available on MOCS' website for a comprehensive list of all applicable definitions.

1.5 ADMINISTRATIVE REQUIREMENTS:

A. At no additional cost to the City of New York, designate an individual who will be responsible for the communication of progress of EPP activities with the Commissioner on a regular basis and for the quality of all EPP-related materials and preparation, coordination and assembly of the supporting documentation.

B. Scope and Applicability: Action submittals and informational submittals are required for all installed equipment, materials and products that require EPP compliance. Provide all required submittals in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

C. Distribution and Compilation: The Contractor must coordinate with all affected trades and is responsible for its Subcontractors complying with the EPP requirements and for providing required EPP documentation as required for the project. The Contractor is responsible for distributing the forms or templates required for the Subcontractors to record EPP documentation. The Contractor is also responsible for collecting and compiling information into packages as described in Section 01 33 00 SUBMITTAL PROCEDURES.

D. The Contractor must respond in a timely manner to questions and requests from the Commissioner, Design Consultant and MOCS regarding EPP requirements that are the responsibility of the Contractor. Document responses as informational submittals.

1.6 ACTION SUBMITTALS:

A. General Requirements:

1. EPP Documentation Submittals for applicable and compliant product data, as stated in the EPP Minimum Standards for Construction Products, is to be documented in the form of a Vendor Survey and supporting manufacturer's data sheets highlighting EPP compliance-related data. Include in the Vendor Survey the anticipated quantity of product purchased and cost per unit data. See attached sample Vendor Survey form.

2. Compliance with EPP requirements will be used as one criterion to evaluate product selection. Assemble EPP Documentation Submittal information into one package per contract specification section(s) (or per Subcontractor). Incomplete or inaccurate EPP Documentation submittals may be used as the basis for the rejection of products or assemblies.

3. Update the quantities and costs in the Vendor Survey once products are approved and purchased and document as information submittal.

1.7 INFORMATIONAL SUBMITTALS

A. For each registered contract, the Contractor must maintain a Master Vendor Survey, an updated tracking log of all equipment, materials and products purchased on a contract that are required to comply with EPP. Submit the Master Vendor Survey on a monthly basis and update the costs once products are purchased.

1. Upon request by MOCS, submit the Master Vendor Survey and supporting documents.

B. EPP Progress Reports: Concurrent with each Application for Payment, submit reports of purchasing activities for each of the EPP-applicable equipment, materials and products listed in Sub-section C below.

C. Project Materials Cost Data: For Vendor Survey and EPP Progress Reports, include breakout of costs for the following categories of items:

1. Appliances.
2. Architectural Coatings.
3. HVAC Equipment.
4. Lighting Products.
5. Miscellaneous Products – Construction.
6. Plumbing Fixtures.

PART II – PRODUCTS

2.1 MATERIALS:

A. Detailed Requirements. This sub-section defines the information and documents to be provided for each EPP-applicable equipment, material and product type, as identified in each specification section:

1. Appliances – Residential:

   All energy-using products for which the United States Environmental Protection Agency and the United States Department of Energy have developed energy efficiency standards for compliance with the Energy Star program shall be ENERGY STAR labeled. The following residential appliances shall comply with this requirement:

   a. Clothes Washers
   b. Dehumidifiers
   c. Dishwashers, Standard-Sized
   d. Freezers, Upright, Chest and Compact
   e. Refrigerators and Refrigerator-Freezers, Standard-Sized and Compact

   Microwave Ovens shall comply with the following requirements:

   a. Recommended Standby Levels: 2 watts or less
   b. Best Available Standby Level: 2 watts or less

2. Architectural Coatings:

   a. For the products listed below, the maximum content of Volatile Organic Compounds (VOCs) shall be determined according to the American Society for Testing and Materials test method D 5116 (Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products).

Architectural Coating	**Maximum Concentration of VOC in Grams per Liter**
Clear Wood Coating – Clear-Brushing lacquers	275
Clear Wood Coating – Sanding Sealers (Other than Lacquers)	275
Clear Wood Coating –Varnishes	275
Floor Coatings	100
Lacquers - Pigmented	275
Primers for Flat Paint	100
Primers for Non-Flat Paint	150
Rust Preventative/Anti-Corrosive Paint	250

b. Any product listed below that is compliant with Part 205 of Title Six of the New York Codes, Rules and Regulations meets the standard required under EPP Minimum Standards for Construction Products. The maximum content of VOCs for these products shall be determined according to the test method required under part 205.6 of such part.

Architectural Coating	**Maximum Concentration of VOC in Grams per Liter**
Clear Wood Coating – Conversion Varnishes	725
Clear Wood Coating – Lacquers (Including Lacquer Sanding Sealers)	550
Concrete Bond Breakers	350
Concrete Curing Compounds	350
Concrete Surface Retarders	780
Dry Fog Coatings	400
Faux Finishing Coatings	350
Fire-Resistive Coatings	350
Fire-Retardant Coatings	650
Fire-Retardant Coatings - Opaque	350
Flat Paint	100
Form Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High Temperature Coatings	420
Industrial Maintenance (IM) Coatings	340
Low Solids Coatings	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	300
Metallic Pigmented Coatings	500
Multi-Color Coatings	500
Nonflat High-Gloss Coatings	250
Nonflat Paint	150
Pre-Treatment Wash Primers	420
Primers, Sealers, and Undercoaters	200
Quick-Dry Enamels	250
Quick-Dry Primers, Sealers, and Undercoaters	200
Recycled Coatings	250
Roof Coatings	250
Roof Coatings (Bituminous)	300
Roof Primers (Bituminous)	350
Shellacs – Clear	730
Shellacs – Opaque	550
Specialty Primers, Sealers and Undercoaters	350
Stains	250
Swimming Pool Coatings and Swimming Pool Repair and Maintenance Coatings	340
Thermoplastic Rubber Coatings and Mastics	550
Waterproofing Concrete / Masonry Sealers	400
Waterproofing Sealers	250
Wood Preservatives	350

c. The products listed below shall be recovered material and comply with the Post-consumer Content and Total Recovered Materials Content requirements.

Architectural Coating	Post-consumer Content (%)	Total Recovered Materials Content (%)
Latex Paint – Consolidated	100	100
Latex Paint – Reprocessed White, Off-White and Pastel Colors	20	20
Latex Paint – Reprocessed Grey, Brown, Earthtones and Other Dark Colors	50-99	50-99

3. HVAC Equipment: Commercial and Residential

a. Commercial

All energy-using products for which the United States Environmental Protection Agency and the United States Department of Energy have developed energy efficiency standards for compliance with the Energy Star program shall be ENERGY STAR labeled. The following Commercial HVAC Equipment shall comply with this requirement:

1. Air Conditioners, Air-Cooled
2. Air Conditioners, Gas/Electric Package Units
3. Heat Pumps, Air Source

Chillers shall comply with the following Part Load Optimized Chillers IPLV and Full Load Optimized Chillers IPLV requirements:

Type	Compressor Type and Capacity	Part Load Optimized Chillers IPLV (kW/ton) Required	Full Load Optimized Chillers IPLV (kW/ton) Required
Air-Cooled	Scroll (30 – 60 tons)	0.86 or less	1.23 or less 1.1
Air-Cooled	Reciprocating (30 – 150 tons)	0.90 or less	1.23 or less 1
Air-Cooled	Screw (70 – 200 tons)	0.98 or less	1.23 or less 0.94
Water-Cooled	Centrifugal (150 – 299 tons)	0.52 or less	0.59 or less
Water-Cooled	Centrifugal (300 – 2,000 tons)	0.45 or less	0.56 or less
Water-Cooled	Rotary Screw (>150 tons)	0.49 or less	0.64 or less

b. Residential

All energy-using products for which the United States Environmental Protection Agency and the United States Department of Energy have developed energy efficiency standards for compliance with the Energy Star program shall be ENERGY STAR labeled. The following Residential HVAC Equipment shall comply with this requirement:

1. Air Conditioners, Central (<65,000 Btu/h)

2. Air Conditioners, Central, Gas/Electric Package Units (<65,000 Btu/h)
3. Air Source Heat Pumps (<65,000 Btu/h)
4. Boilers and Boiler/Hot Water Heaters (<300,000 Btu/h)
5. Ceiling Fans
6. Furnaces and Furnace/Hot Water Heaters (<340,000 Btu/h)
7. Ground Source Heat Pumps (Geothermal)
8. In-Line Ventilating Fan
9. Programmable Thermostats
10. Range Hood and Bathroom /Utility Room Ventilating Fans
11. Room Air Cleaners
12. Room Air Conditioners

4. Lighting Products

a. The following lighting products shall comply with the corresponding BEF requirement:

Product Type	**Number of Lamps**	**Required BEF**
Ballast, Fluorescent, Four-Foot, Linear T12, 34-Watts	1	2.64 or higher
Ballast, Fluorescent, Four-Foot, Linear T12, 34-Watts	2	1.41 or higher
Ballast, Fluorescent, Four-Foot, Linear T12, 34-Watts	3	0.93 or higher
Ballast, Fluorescent, Eight-Foot, Linear T12, 60-Watts	2	0.80 or higher
Ballast, Fluorescent, Four-Foot, Linear T8, 32-Watts	1	2.54 or higher
Ballast, Fluorescent, Four-Foot, Linear T8, 32-Watts	2	1.44 or higher
Ballast, Fluorescent, Four-Foot, Linear T8, 32-Watts	3	1.44 or higher
Ballast, Fluorescent, Four-Foot, Linear T8, 32-Watts	4	0.73 or higher
Ballast, Fluorescent, Eight-Foot, Linear T8, 59-Watts	2	0.80 or higher
Ballast, Fluorescent, Four-Foot, U-Bent T12, 34-Watts	1	2.64 or higher
Ballast, Fluorescent, Four-Foot, U-Bent T12, 34-Watts	2	1.41 or higher
Ballast, Fluorescent, Four-Foot, U-Bent T12, 34-Watts	3	0.93 or higher
Ballast, Fluorescent, U-Tube, U-Bent T8, 32-Watts	1	2.54 or higher
Ballast, Fluorescent, U-Tube, U-Bent T8, 32-Watts	2	1.44 or higher
Ballast, Fluorescent, U-Tube, U-Bent T8, 32-Watts	3	0.93 or higher
Ballast, Fluorescent, U-Tube, U-Bent T8, 32-Watts	4	0.73 or higher

b. All energy-using products for which the United States Environmental Protection Agency and the United States Department of Energy have developed energy efficiency standards for compliance with the Energy Star program shall be ENERGY STAR labeled. The following Lighting Products shall comply with this requirement:

1. Exit Signs
2. Luminaires, Residential

c. Luminaires, Downlight, With Compact Fluorescent Lamps (13-32 Lamp Wattage) shall comply with the following LER requirements:

Luminaire Type (NEMA Designation)	Required LER
Open Optics	29 or higher
Baffled Optics	21 or higher
Lensed Optics	24 or higher

d. Luminaires, Downlight, With Metal Halide Lamps (<150 Watts) shall comply with the following LER requirements:

Luminaire Type (NEMA Designation)	Required LER
Open Optics	35 or higher
Lensed Optics	30 or higher

e. Luminaires, Fluorescent shall comply with the following LER requirements:

Luminaire Type (NEMA Designation)	Number of Lamps	Required LER
Lensed (FL)	2	62 or higher
Lensed (FL)	3	61 or higher
Lensed (FL)	4	61 or higher
VDT-Preferred Louvered (FP)	2	50 or higher
VDT-Preferred Louvered (FP)	3	51 or higher
VDT-Preferred Louvered (FP)	4	54 or higher
Four-Foot (FW)	2	63 or higher
Four-Foot (FW)	4	62 or higher
Four-Foot (FS)	1	70 or higher
Four-Foot (FS)	2	70 or higher
Four-Foot (FI)	1	67 or higher
Eight-Foot (FI)	2	68 or higher

f. Luminaires, Industrial HID, With High Pressure Sodium Lamps (<150 Lamp Wattage) shall comply with the following LER requirements:

Upward Efficiency	Lamp Wattage	Closed Fixture (HR) LER Required	Open Fixture (HR) LER Required
0%	150-399	58 or higher	68 or higher
0%	400-999	63 or higher	84 or higher
0%	>1000	N/A	N/A
1%-10%	150-399	64 or higher	63 or higher
1%-10%	400-999	82 or higher	89 or higher
1%-10%	>1000	N/A	109 or higher
11%-20%	150-399	N/A	78 or higher

11%-20%	400-999	N/A	94 or higher
11%-20%	>1000	N/A	N/A
>20%	150-399	75 or higher	77 or higher
>20%	400-999	N/A	N/A
>20%	>1000	N/A	N/A

5. Miscellaneous Products – Construction

a. For the products listed below, the maximum content of Volatile Organic Compounds (VOCs) shall be determined according to the American Society for Testing and Materials test method D 5116 (Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products). The products may not contain any volatile organic compound in any concentration exceeding that specified below. Products that are compliant with the Green Label Plus program of the Carpet and Rug Institute are also compliant with this standard.

Carpet Adhesives		
Volatile Organic Compound	**24-Hour Testing Maximum Emission Factor (µg/m2•hr)**	**14-Day Testing Maximum Emission Factor (µg/m2•hr)**
Formaldehyde	50	31
2-ethyl-1-hexanol	300	300
Total Volatile Organic Compounds	800	N/A
Carpet Cushions		
Volatile Organic Compound	**24-Hour Testing Maximum Emission Factor (µg/m2•hr)**	**14-Day Testing Maximum Emission Factor (µg/m2•hr)**
Butylated Hydroxytoluene	300	N/A
Formaldehyde	50	N/A
4-Phenylcyclohexene (4PCH)	50	N/A
Total Volatile Organic Compounds	1000	N/A
Carpets		
Volatile Organic Compound	**24-Hour Testing Maximum Emission Factor (µg/m2•hr)**	**14-Day Testing Maximum Emission Factor (µg/m2•hr)**
Formaldehyde	50	30
4-Phenylcyclohexene	50	17
Styrene	410	410
Total Volatile Organic Compounds	500	N/A

b. The products listed below shall comply with the Recycled Post-consumer Content and Total Recovered Materials Content requirements.

Carpet Cushion – Bonded Polyurethane		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Old Carpet Cushion	15-50	15-50
Carpet Cushion – Jute		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Burlap	40	40
Carpet Cushion – Rubber		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Tire Rubber	60-90	60-90
Carpet Cushion – Synthetic Fibers		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Carpet Fabrication Scrape	No Range Recommended	100
Cement and Concrete		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Cenospheres	No Range Recommended	Minimum 10% (by volume)
Coal fly Ash	No Range Recommended	No Range Recommended
GGBF Slag	No Range Recommended	No Range Recommended
Silica Fume	No Range Recommended	5-10% of cementitious material (dry weight basis)
Channelizers		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Plastic	25-90	No Range Recommended
Rubber (base only)	100	No Range Recommended
Delineators – Fixed		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Plastic	25-90	No Range Recommended
Rubber (base only)	100	No Range Recommended
Steel (BOF, base only)	16	25-30
Steel (BOF, base only)	67	100
Delineators – Flexible		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Plastic PET	25-85	No Range Recommended
Floor Tiles		
Material	Recovered Post-consumer Content (%)	Total Recovered Materials Content (%)
Rubber	90-100	No Range Recommended
Plastic	No Range Recommended	90-100
Insulation - Cellulose		

Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Post-consumer Paper	75	75
Insulation - Foam-In-Place		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Recovered Material	No Range Recommended	5
Insulation - Glass Fiber Reinforced		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Recovered Material	No Range Recommended	6
Insulation - Laminated Paperboard		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Post-consumer Paper	100	100
Insulation - Perlite Composition Board		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Post-consumer Paper	23	23
Insulation - Phenolic Rigid Foam	**Insulation - Phenolic Rigid Foam**	**Insulation - Phenolic Rigid Foam**
Material	**Material**	**Material**
Recovered Material	Recovered Material	Recovered Material
Insulation - Plastic, Non-woven Batt	**Insulation - Plastic, Non-woven Batt**	**Insulation - Plastic, Non-woven Batt**
Material	**Material**	**Material**
Recovered and/or Post-consumer Plastic	Recovered and/or Post-consumer Plastic	Recovered and/or Post-consumer Plastic
Insulation - Plastic Rigid Foam, Polyisocyanurate/Polyurethane: Rigid Foam	**Insulation - Plastic Rigid Foam, Polyisocyanurate/Polyurethane: Rigid Foam**	**Insulation - Plastic Rigid Foam, Polyisocyanurate/Polyurethane: Rigid Foam**
Material	**Material**	**Material**
Recovered Material	Recovered Material	Recovered Material
Insulation - Structural Fiberboard	**Insulation - Structural Fiberboard**	**Insulation - Structural Fiberboard**
Material	**Material**	**Material**
Recovered Material	Recovered Material	Recovered Material
Modular Threshold Ramps	**Modular Threshold Ramps**	**Modular Threshold Ramps**
Material	**Material**	**Material**
Steel (BOF)	Steel (BOF)	Steel (BOF)
Steel (EAF)	Steel (EAF)	Steel (EAF)
Aluminum	Aluminum	Aluminum
Rubber	Rubber	Rubber

Nonpressure Pipe		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Steel (BOF)	16	25-30
Steel (EAF)	67	100
Plastic (HDPE)	100	100
Plastic (PVC)	5-15	25-100
Cement	No Range Recommended	No Range Recommended
Playground Equipment		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Plastic	90-100	100
Plastic Composite	50-75	95-100
Steel (BOF)	16	95
Steel (EAF)	50-100	95-100
Restroom Dividers/Partitions, Steel		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Steel (from BOF)	16	25-30
Steel (from EAF)	67	100
Roofing Materials		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Steel (BOF)	16	25-30
Steel (EAF)	67	100
Aluminum	20-95	20-95
Fiber (felt) or Fiber Composite	50-100	50-100
Rubber	12-100	100
Plastic or Plastic/Rubber Composite	100	100
Wood/Plastic Composite	No Range Recommended	100
Cement	No Range Recommended	No Range Recommended
Shower Dividers/Partitions, Steel		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Steel (from BOF)	16	25-30
Steel (from EAF)	67	100
Traffic Barricades		
Material	**Recovered Post-consumer Content (%)**	**Total Recovered Materials Content (%)**
Plastic (High Density Polyethylene [HDPE], Low-Density Polyethylene [LDPE], Polyethylene terephthalate [PET])	80-100	100
Steel (BOF)	16	25-30
Steel (EAF)	67	100
Fiberglass	No Range Recommended	No Range Recommended

c. All energy-using products for which the United States Environmental Protection Agency and the United States Department of Energy have developed energy efficiency standards for compliance with the Energy Star program shall be ENERGY STAR labeled. The following Construction Products shall comply with this requirement:

1. Entry or Patio Doors, Residential
2. Residential Skylights
3. Residential Windows & Tubular Daylighting Devices
4. Roof Products

d. Electric Motors shall comply with the following Nominal Efficiencies requirements:

Nominal Efficiencies for Induction Motors Rated 600 Volts or Less (Random Wound)						
Motor Size (HP)			**Open Drip-Proof (ODP)**		**Totally Enclosed Fan-Cooled (TEFC)**	
6-pole (1200 rpm)	**4-pole (1200 rpm)**	**2-pole (1200 rpm)**	**6-pole (1200 rpm)**		**4-pole (1200 rpm)**	**2-pole (1200 rpm)**
1	82.5	85.5	77.0	82.5	85.5	77.0
1.5	86.5	86.5	84.0	87.5	86.5	84.0
2	87.5	86.5	85.5	88.5	86.5	85.5
3	88.5	89.5	85.5	89.5	89.5	86.5
5	89.5	89.5	86.5	89.5	89.5	88.5
7.5	90.2	91.0	88.5	91.0	91.7	89.5
10	91.7	91.7	89.5	91.0	91.7	90.2
15	91.7	93.0	90.2	91.7	92.4	91.0
20	92.4	93.0	91.0	91.7	93.0	91.0
25	93.0	93.6	91.7	93.0	93.6	91.7
30	93.6	94.1	91.7	93.0	93.6	91.7
40	94.1	94.1	92.4	94.1	94.1	92.4
50	94.1	94.5	93.0	94.1	94.5	93.0
60	94.5	95.0	93.6	94.5	95.0	93.6
75	94.5	95.0	93.6	94.5	95.4	93.6
100	95.0	95.4	93.6	95.0	95.4	94.1
125	95.0	95.4	94.1	95.0	95.4	95.0
150	95.4	95.8	94.1	95.8	95.8	95.0
200	95.4	95.8	95.0	95.8	96.2	95.4
250	95.4	95.8	95.0	95.8	96.2	95.8
300	95.4	95.8	95.4	95.8	96.2	95.8
350	95.4	95.8	95.4	95.8	96.2	95.8
400	95.8	95.8	95.8	95.8	96.2	95.8
450	96.2	96.2	95.8	95.8	96.2	95.8
500	96.2	96.2	95.8	95.8	96.2	95.8

Nominal Efficiencies for Induction Motors Rated Medium Voltage or Less (Form Wound)					
Motor Size (HP)		**Open Drip-Proof (ODP)**		**Totally Enclosed Fan-Cooled (TEFC)**	
6-pole (1200 rpm)	**4-pole (1200 rpm)**	**2-pole (1200 rpm)**	**6-pole (1200 rpm)**	**4-pole (1200 rpm)**	**2-pole (1200 rpm)**
250-500	95.0	95.0	94.5	95.0	95.0	95.0

6. Plumbing Fixtures.
   a. The plumbing fixtures shall comply with the following Water Efficiency requirements:

Plumbing Fixture	**Water Efficiency Requirement**
Lavatory Faucets	< 2.0 gallons per minute
Showerheads, Residential and Commercial	< 2.2 gallons per minute
Toilets, Residential and Commercial	< 1.6 gallons per flush
Urinals, Residential and Commercial	< 1.0 gallons per flush

PART III – EXECUTION (Not Used)

END OF SECTION 01 81 13.10

EPP VENDOR SURVEY FORM

Instructions: In the space provided, indicate the following: (1.) Choose Construction for the EPP Book Used (2.) Choose the product type from the drop-down menu; (3.) Choose the product detail from the drop-down menu; (4.) Identify the specific item under Product Description; (5.) Enter the number of products per unit; (6.) Enter the cost per unit; (7.) Enter the units purchased; (8.) Enter the total cost.

Return completed spreadsheet to the contracting agency in the accompanying letter. Thank you.

Agency Acronym	Environmental Preferable Purchasing Information				Quantity and Cost Information				
	EPP Book Used	Product Type	Product Details	Product Description	Products Per Unit	Cost Per Unit	Units Purchased	Total Cost	Comments
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
DDC								$0.00	
TOTAL					0.00	$0.00	0.00	$0.00	

SECTION 01 81 13.13
VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED v3 BUILDINGS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 13.13

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY:

A. This Section includes requirements for volatile organic compound (VOC) content in adhesives, sealants, paints and coatings used for the project.

B. All sections in the Project Specifications with adhesives, sealant or sealant primer applications, paints and coatings will follow all requirements of this section. In the event of any conflict or inconsistency between this section and the Specifications regarding adhesives, sealant or sealant applications, paints and coatings, the requirements set forth in this Section will prevail.

C. This Section includes:

1. General Requirements
2. References
3. VOC Requirements for Interior Adhesives
4. VOC Requirements for Interior Sealants
5. VOC requirements for Interior Paints
6. VOC requirements for Interior Coatings
7. Submittals

1.3 RELATED SECTIONS: include without limitation the following:

A.	Section 01 10 00	SUMMARY
B.	Section 01 31 00	PROJECT MANAGEMENT AND COORDINATION
C.	Section 01 32 00	CONSTRUCTION PROGRESS DOCUMENTATION
D.	Section 01 33 00	SUBMITTAL PROCEDURES
E.	Section 01 73 00	EXECUTION
F.	Section 01 77 00	CLOSEOUT PROCEDURES
G.	Section 01 78 39	CONTRACT RECORD DOCUMENTS
H.	Section 01 81 13.03	SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS
I.	Section 01 81 13.04	SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS
J.	Section 01 81 19	INDOOR AIR QUALITY FOR LEED BUILDINGS

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

ADHESIVE	Any substance used to bond one surface to another by attachment. Includes adhesive primers and adhesive bonding primers. A. Aerosol Adhesive: Any adhesive packaged as an aerosol with a spray mechanism permanently housed in a non-refillable can designed for hand-held application without the need for ancillary equipment.
CARCINOGEN	A chemical listed as a known, probable, reasonably anticipated, or possible human carcinogen by the International Agency for Research on Cancer (IARC) (Groups 1, 2A, and 2B), the National Toxicology Program (NTP) (Groups 1 and 2), the U.S. Environmental Protection Agency (EPA) Integrated Risk Information System (IRIS) (weight-of-evidence classifications A, B1, B2, and C, carcinogenic, likely to be carcinogenic, and suggestive evidence of carcinogenicity or carcinogen potential), or the Occupational Safety and Health Administration (OSHA).
CLEAR WOOD FINISH	Clear/semi-transparent coating applied to wood substrates to provide a transparent or translucent solid film. 1. Lacquer: Clear/semi-transparent coating formulated with cellulosic or synthetic resins to dry by evaporation without chemical reaction and provide a solid, protective film. 2. Sanding Sealer: A sanding sealer that also meets the definition of a lacquer. 3. Varnish: Clear/semi-transparent coating, excluding lacquers and shellacs, formulated to dry by chemical reaction on exposure to air. May contain small amounts of pigment.
COATING	Liquid, liquefiable, or mastic composition that is converted to a solid adherent film after application to a substrate as a thin layer; and is used for decorating, protecting, identifying or to serve some functional purpose such as the filling or concealing of surface irregularities or the modification of light and heat radiation characteristics; and is intended for on-site application to interior or exterior surfaces of buildings. Does not include stains, clear finishes, recycled latex paint, specialty (industrial, marine or automotive) coatings or paint sold in aerosol cans.
FLOOR COATING	Opaque coating applied to flooring. Excludes industrial maintenance coatings.
HAZARDOUS AIR POLLUTANT	Any compound listed by the U.S. EPA in the Clean Air Act, Section 112(b)(1) as a hazardous air pollutant.

MUTAGEN	A chemical that meets the criteria for category 1, chemicals known to induce heritable mutations or to be regarding as if they induce heritable mutations in the germ cells of humans, under the Harmonized System for the Classification of Chemicals Which Cause Mutations in Germ Cells (United Nations Economic Commission for Europe, Globally Harmonized System of Classification and Labeling of Chemicals).
OZONE-DEPLETING COMPOUNDS	A compound with an ozone-depletion potential greater than 0.1 (CFC 11=1) according to the U.S. EPA list of Class I and Class II Ozone-Depleting Substances.
PAINT	A pigmented coating. For the purposes of this specification, paint primers are considered to be paints. 1. Flat Coating or Paint: Has a gloss of less than 15 (using an 85-degree meter) or less than 5 (using a 60-degree meter). 2. Non-Flat Coating or Paint: Has a gloss of greater than or equal to 15 (using an 85-degree meter) or greater than or equal to 5 (using a 60-degree meter). 3. Non-Flat High-Gloss Coating or Paint: Has a gloss of greater than or equal to 70 (using a 60-degree meter). 4. Anti-Corrosive / Rust Preventative Paint: Coating formulated and recommended for use in preventing the corrosion of ferrous metal substrates.
PRIMER	Coating that is formulated and recommended for one or more of the following purposes: to provide a firm bond between the substrate and a subsequent coating; to prevent a subsequent coating from being absorbed into the substrate; to prevent harm to a subsequent coating from materials in the substrate; or to provide a smooth surface for application of a subsequent coating.
REPRODUCTIVE TOXIN	A chemical listed as a reproductive toxin (including developmental, female, and male toxins) by the State of California under the Safe Drinking Water and Toxic Enforcement Act of 1986 (California Code of Regulations, Title 22, Division 2, Subdivision 1, Chapter 3, Sections 1200, et. Seq.).
SANDING SEALER	Clear/semi-transparent coating formulated to seal bare wood. Can be abraded to create a smooth surface for subsequent coatings. Does not include sanding sealers that are lacquers (see Clear Wood Finish above).
SEALANT	Any material with adhesive properties, formulated primarily to fill, seal, or waterproof gaps or joints between surfaces. Includes sealant primers and caulks.

SHELLAC	Clear or pigmented coating formulated solely with the resinous secretions of the lac beetle, thinned with alcohol and formulated to dry by evaporation without chemical reaction. Excludes floor applications.
STAIN	Clear semi-transparent/opaque coating formulated to change the color but not conceal the grain pattern or texture of the substrate.
VOLATILE AROMATIC COMPOUND	Any hydrocarbon compound containing one or more 6-carbone benzene rings, and having an initial boiling point less than or equal to 280 degrees Celsius measured at standard conditions of temperature and pressure.
VOLATILE ORGANIC COMPOUND	Any compound of carbon (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate) which vaporizes (becomes a gas) and participates in atmospheric photochemical reactions, as specified in Part 51.00 of Chapter 40 of the U.S. Code of Federal Regulations, at normal room temperatures. For the purposes of this specification, formaldehyde and acetaldehyde are considered to be VOCs.
WATERPROOFING SEALER	A coating that prevents the penetration of water into porous substrates.

1.5 GENERAL REQUIREMENTS:

A. The City of New York is committed to implementing good environmental practices and procedures which include achieving a LEED Green building rating. Specific project requirements related to this goal which may impact this area of work are listed in the applicable paragraphs of this specification section. The Contractor must ensure that the requirements as defined in the sections below and in related sections of the Contract Documents, are implemented to the fullest extent. Substitutions, or other changes to the work proposed by the Contractor or its Subcontractors, must not be allowed if such changes compromise the stated environmental goals.

1.6 REFERENCES:

A. Rule 1168 – “Adhesive and Sealant Applications”, amended 7 January 2005): South Coast Air Quality Management District (SCAQMD), State of California, www.aqmd.gov

B. Rule 1113 - “Architectural Coatings”, amended 9 July 2004: South Coast Air Quality Management District (SCAQMD), State of California, www.aqmd.gov

C. Green Seal Standard GS-11- “Paints”, of Green Seal, Inc., Washington, DC, www.greenseal.org

D. Green Seal Standard GC-03- “Anti-Corrosive Paints”, of Green Seal, Inc., Washington, DC, www.greenseal.org

1.7 VOC REQUIREMENTS FOR INTERIOR ADHESIVES, SEALANTS, PAINTS AND COATINGS:

A. GENERAL: Unless otherwise specified herein, the VOC content of all interior adhesives, sealants, paints and coatings (herein referred to as “products”) must not be in excess of **250 grams per liter.**

B. No product may contain any ingredients that are carcinogens, mutagens, reproductive toxins, persistent bioacculmulative compounds, hazardous air pollutants, or ozone-depleting compounds. An exception must be made for titanium dioxide and, for products that are pre-tinted by the manufacturer, carbon black, which must be less than or equal to 1% by weight of the product.

C. No product will contain the following:
   1. methylene chloride
   2. 1,1,1-trichloroethane
   3. benzene
   4. toluene
   5. ethylbenzene
   6. vinyl chloride
   7. naphthalene
   8. 1,2-dichlorobenzene
   9. di (2-ethylhexyl) phthalate
   10. butyl benzyl phthalate
   11. di-n-butyl phthalate
   12. di-n-octyl phthalate
   13. diethyl phthalate
   14. dimethyl phthalate
   15. isophorone
   16. antimony
   17. cadmium
   18. hexavalent chromium
   19. lead
   20. mercury
   21. formaldehyde
   22. methyl ethyl ketone
   23. methyl isobutyl ketone
   24. acrolein
   25. acrylonitrile

D. No product will contain more than 1.0% by weight of sum total of volatile aromatic compounds.

1.8 VOC REQUIREMENTS FOR INTERIOR ADHESIVES:

A. The volatile organic compound (VOC) content of adhesives, adhesive bonding primers, or adhesive primers used in this project must not exceed the limits defined in Rule 1168 – "Adhesive and Sealant Applications" of the South Coast Air Quality Management District (SCAQMD), of the State of California.

B. The VOC limits defined by SCAQMD are as follows. All VOC limits are defined in grams per liter, less water and less exempt compounds.

C. For specified building construction related applications, the allowable VOC content is as follows:

1. Architectural Applications**:**

a.	Indoor carpet adhesive	50
b.	Carpet pad adhesive	50
c.	Wood flooring adhesive	100
d.	Rubber floor adhesive	60
e.	Subfloor adhesive	50
f.	Ceramic tile adhesive	65
g.	VCT and asphalt tile adhesive	50
h.	Drywall and panel adhesive	50
i.	Cove base adhesive	50
j.	Multipurpose construction adhesive	70
k.	Structural glazing adhesive	100

2. Specialty Applications:

a.	PVC welding	510

b.	CPVC welding	490
c.	ABS welding	325
d.	Plastic cement welding	250
e.	Adhesive primer for plastic	550
f.	Contact Adhesive	80
g.	Special Purpose Contact Adhesive	250
h.	Structural Wood Member Adhesive	140
i.	Sheet Applied Rubber Lining Operations	850
j.	Top and Trim Adhesive	250

3. Substrate Specific Applications:

a.	Metal to metal	30
b.	Plastic foams	50
c.	Porous material (except wood)	50
d.	Wood	30
e.	Fiberglass	80

4. Aerosol Adhesives:

a.	General purpose mist spray	65% VOC's by weight
b.	General purpose web spray	55% VOC's by weight
c.	Special purpose aerosol adhesives (all types)	70% VOC's by weight

1.9 VOC REQUIREMENTS FOR INTERIOR SEALANTS:

A. The volatile organic compound (VOC) content of sealants, or sealant primers used in this project must not exceed the limits defined in Rule 1168 – "Adhesive and Sealant Applications" of the South Coast Air Quality Management District (SCAQMD), of the State of California.

B. The VOC limits defined by SCAQMD are as follows. All VOC limits are defined in grams per liter, less water and less exempt compounds.

1. Sealants:

a.	Architectural	250
b.	Non-membrane roof	300
c.	Roadway	250
d.	Single-ply roof membrane	450
e.	Other	420

2. Sealant Primer:

a.	Architectural – Nonporous	250
b.	Architectural – Porous	775
c.	Other	750

1.10 VOC REQUIREMENTS FOR INTERIOR PAINTS:

A. Paints and Primers: Paints and primers used in non-specialized interior applications (i.e., for wallboard, plaster, wood, metal doors and frames, etc.) must meet the VOC limitations of the Green Seal Paint Standard GS-11, of Green Seal, Inc., Washington, DC. Product-specific environmental requirements are as follows:

1. Volatile Organic Compounds:
   a. The VOC concentrations (in grams per liter) of the product must not exceed those listed below as determined by U. S. Environmental Protection Agency (EPA) Reference Test Method 24.

   <u>Interior Paints and Primers</u>:
   Non-flat: 150 g/l

Flat: 50 g/l
The calculation of VOC must exclude water and tinting color added at the point of sale.

B. Anti-Corrosive and Anti-Rust Paints: Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates must meet the VOC limitations of the Green Seal Paint Standard GC-03, of Green Seal, Inc., Washington, DC. Product-specific environmental requirements are as follows:
1. Volatile Organic Compounds:
   a. The VOC concentrations (in grams per liter) of the product must not exceed those listed below as determined by U. S. Environmental Protection Agency (EPA) Reference Test Method 24.
      Anti-Corrosive and Anti-Rust Paints: 250 g/l

   The calculation of VOC must exclude water and tinting color added at the point of sale.

1.11 VOC REQUIREMENTS FOR INTERIOR COATINGS:

A. Clear wood finishes, floor coatings, stains, sealers, and shellacs applied to the interior must meet the VOC limitations defined in Rule 1113, "Architectural Coatings" of SCAQMD, of the State of California. The VOC limits defined by SCAQMD, based on 7/9/04 amendments, are as follows. VOC limits are defined in grams per liter, less water and less exempt compounds.

1.	Clear Wood Finishes:	
	a. Varnish	350
	b. Sanding Sealers	350
	c. Lacquer	550
2.	Shellac:	
	a. Clear	730
	b. Pigmented	550
3.	Stains	250
4.	Floor Coatings	100
5.	Waterproofing Sealers	250
6.	Sanding Sealers	275
7.	Other Sealers	200

The calculation of VOC must exclude water and tinting color added at the point of sale.

1.12 SUBMITTALS:

A. Submit Material Safety Data Sheets, for all applicable products in accordance with Section 01 33 00 SUBMITTAL PROCEDURES. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings. Material Safety Data Sheets must indicate the Volatile Organic Compound (VOC) limits of products submitted. (If an MSDS does not include a product's VOC limits, then product data sheets, manufacturer literature, or a letter of certification from the manufacturer can be submitted in addition to the MSDS to indicate the VOC limits).

B. Submit Environmental Building Materials Certification Form (EBMCF) as referenced in Section 01 81 13.03 SUSTAINABLE REQUIREMENTS FOR LEED v3 BUILDINGS: For each field-applied adhesive, sealant, paint, and coating product, provide the VOC requirement, as provided in this Specification, for the relevant material category indicated on the documentation noted above.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 81 13.13

SECTION 01 81 19
INDOOR AIR QUALITY REQUIREMENTS FOR LEED BUILDINGS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 81 19

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 CONSTRUCTION IAQ MANAGEMENT GOALS FOR THE PROJECT:

A. The City of New York has determined that this Project must minimize the detrimental impacts on Indoor Air Quality (IAQ) resulting from construction Subcontractor activities. Factors that contaminate indoor air, such as dust entering HVAC systems and ductwork, improper storage of materials on-site, and poor housekeeping, must be minimized.

1.3 RELATED SECTIONS:

A. All sections of the Specifications related to interior construction, MEP systems and items affecting indoor air quality.

B. Division 9 (of the Specifications): Finishes.

C. Refer to the Addendum to identify whether this project is designed to comply with a Certification Level according to the U.S. Green Building Council's LEED Rating System, as specified in Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.

D. Refer to the Addendum to identify whether this project is designed to comply with Section 01 81 13.13 VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS FOR LEED v3 BUILDINGS.

E. Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS.

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Design Consultant	The entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.

Volatile Organic Compounds (VOCs)	Chemical compounds common in and emitted by many building products, including solvents in paints, coatings, adhesives and sealants, wood preservatives, composite wood binder, and foam insulations. Not all VOCs are harmful, but many of those contained within building products contribute to the formation of smog and may irritate building occupants by their smell or health impact.
Materials that act as “sinks” for VOC contamination	Absorptive materials, typically dry and soft materials (such as textiles, carpeting, acoustical ceiling tiles and gypsum board) that readily absorb VOCs emitted by “source” materials and release them over a prolonged period of time.
Materials that act as “sources” for VOC contamination	Products with high VOC contents that emit VOCs either rapidly during application and curing (typically "wet" products, such as paints, sealants, adhesives, caulks and sealers) or over a prolonged period (typically “dry” products such as flooring coverings with plasticizers and engineered wood with formaldehyde).

1.5 REFERENCES, RESOURCES:

A. “IAQ Guidelines for Occupied Buildings Under Construction”, Second Edition, 2007, The Sheet Metal and Air Conditioner Contractors National Association (SMACNA). (703) 803-2980, www.smacna.org.

B. ANSI/ASHRAE 52.2-2007, “Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size”, www.ashrae.org.

1.6 LEED BUILDING GENERAL REQUIREMENTS:

A. Implement practices and procedures as necessary to meet the Project’s environmental performance goals as set forth in the specific requirements of this section. Specific Project goals that may impact this area of work include: use of recycled-content materials; use of low-emitting materials; construction waste recycling; and the implementation of a construction indoor air quality management plan. Ensure that the requirements related to these goals, as defined in this section, are implemented to the fullest extent. Substitutions or other changes to the work will not be allowed if such changes compromise the stated LEED building performance criteria.

1.7 CONSTRUCTION IAQ MANAGEMENT PLAN:

A. The Contractor must prepare a Construction IAQ Management Plan in coordination with each Subcontractor and submit the Construction IAQ Management Plan to the Commissioner for approval in accordance with Section 01 33 00 SUBMITTAL PROCEDURES. The Construction IAQ Management Plan must meet the following criteria:

1. Construction activities must be planned to meet or exceed the minimum requirements of SMACNA’s “IAQ Guidelines for Occupied Buildings under Construction”, Second Edition, 2007.

2. Absorptive materials must be protected from moisture damage when stored on-site and after installation.

3. The planned operation of air handlers during construction must be described. If air handlers are to be used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 must be used at each return air grille and return or transfer duct inlet opening, such that there is no bypass around the filtration media, as determined by ASHRAE 52.2-2007.

4. Filtration media must be replaced immediately prior to occupancy. Filtration media must have a MERV of 13 as determined by ASHRAE 52.2-2007.

5. A sequence of finish installation plan “Plan” must be developed, highlighting measures to reduce the absorption of VOCs by materials that act as “sinks”.

6. The use of tobacco products is prohibited inside the building and within 25 feet of the building entrance during construction.

7. A flush-out or air testing must be performed.

8. Upon approval of the finish installation plan by the Commissioner, it must be implemented by the Contractor through the duration of the construction process, and documented in accordance with the Submittal Requirements of Sub-Section 1.8 herein.

B. Detailed requirements of the Construction IAQ Management Plan are as follows:

1. SMACNA Guidelines: Chapter 3 of the referenced "IAQ Guidelines for Occupied Buildings Under Construction", outline IAQ measures in five categories as listed below. The Construction IAQ Management Plan must be organized in accordance with the SMACNA format, and must address measures to be implemented in each of the five categories (including subsections). All subsections must be listed in the Plan; items that are not applicable for this Project should be listed as such.

a. HVAC Protection

1) Protect air handling, distribution equipment and air supply, and return ducting during construction.

2) All ductwork arriving on site will be sealed with plastic sheeting and stored on pallets or dunnage until installed.

3) Cover and protect all exposed air inlets and outlets, openings, grilles, ducts, plenums, etc. to prevent water, moisture, dust and other contaminant intrusion.

4) Apply protection immediately after ducting.

5) Protect ducting runs at the end of day's work.

6) Inspect temporary filtration weekly and replace as required to maintain the proper ventilation rates in the building.

7) To reduce debris and contamination to mechanical systems, do not store materials in mechanical rooms.

b. Source Control

1) Protect stored on-site or installed absorptive or porous materials. Store materials in dry conditions indoors, under cover, and off the ground or floor.

2) Do not use wet or damaged porous materials in the building. Materials which become contaminated through direct exposure to moisture from precipitation, plumbing leaks, or condensation must be replaced by the Contractor, at no additional cost to the City of New York.

3) Use low-toxicity and low-VOC materials to the greatest extent possible.

4) Recover, isolate, and ventilate containers housing toxic materials and materials with VOC levels above the limits for interior adhesives, sealants, paints, and coatings described in these Specifications.

5) Prevent exhaust fumes from idling vehicles, equipment and fossil-fueled tools from entering the building.

6) Containers housing toxic materials and materials with VOC levels above the limits for interior adhesives, sealants, paints, and coatings described in these Specifications, must be closed when not in use.

7) Enforce the no-smoking job site policy.

c. Pathway Interruption

1) Depressurize work areas which contain dust and odors.

2) Pressurize occupied spaces to prevent intrusion of dust and odors.

3) Erect barriers to contain construction areas.

4) Relocate pollutant sources.

5) Temporarily seal the building and provide 100% outside air for ventilation.

6) Provide walk-off mats at entryways to reduce introduced dirt and pollutants.

7) Use dust guards and collectors on saws and other tools.

d. Housekeeping

1) Store materials on elevated platforms under cover, in a designated dry, clean location, prior to unpacking for installation.

2) If materials are not stored in an enclosed location, cover tops and sides of material with waterproof sheeting, securely tied.

3) Institute cleaning activities to remove contaminants from the building prior to occupancy. Clean all coils, air filters and ductwork prior to performing testing, adjusting and balancing of HVAC systems.

4) Sweep the work area on a daily basis. Use an efficient and effective dust collecting method such as damp cloth, wet mop, or vacuum with high-efficiency particulate filters. Activities which produce high levels of dust must be cleaned up immediately upon completion.

5) Spills or excess applications of products containing solvents, or with VOC levels above the limits for interior adhesives, sealants, paints and coatings described in these Specifications, must be removed immediately.

6) Dust all walls prior to application of finishes.

7) Vacuum all stud tracks prior to application of insulation.

8) Keep materials organized to improve job safety as well as indoor air quality.

e. Scheduling

1) Phase construction such that absorptive materials are installed only in areas that are weathertight.

2) Schedule activities that utilize “sources” of VOC contamination to take place prior to installing high absorbent materials that will act as “sinks” for contaminants.

3) Review of the appropriate components of the Construction IAQ Management Plan must be a regular action topic at weekly site coordination meetings. Implementation of the Plan must be documented in the meeting minutes.

2. Protection of Materials from Moisture Damage: As part of the “Source Control” section of the Construction IAQ Management Plan, measures to prevent installed materials or material stored on-site from moisture damage must be described. This section must also describe corrective measures to be taken if moisture damage does occur to absorptive materials during the course of construction (see Section 1.7 B.1.b).

3. Replacement of Filtration Media: Under the “HVAC Protection” section of the Construction IAQ Management Plan, a description of the filtration media in all ventilation equipment must be provided.

The description must include replacement criteria for filtration media during construction, and confirmation of filtration media replacement for all equipment immediately prior to occupancy.

4. Sequence of Finish Installation for Materials: Where feasible, absorptive materials must be installed after the installation of materials or finishes which have high short-term emissions of VOCs, formaldehyde, particulates, or other air-borne compounds. Absorptive materials include, but are not limited to: carpets; acoustical ceiling panels; fabric wall coverings; insulations (exposed to the airstream); upholstered furnishings; and other woven, fibrous or porous materials. Materials with high short-term emissions include, but are not limited to: adhesives, sealants and glazing compounds (specifically those with petrochemical vehicles or carriers); paints, wood preservatives and finishes; control and/or expansion joint fillers; hard finishes requiring adhesive installation; gypsum board (with associated finish processes and products); and composite or engineered wood products with formaldehyde binders.

5. Pre-Occupancy Phase: Perform either a flush-out or air sample testing (Options 1 or 2, respectively), as follows:

   a. <u>OPTION 1 — Flush-Out</u>

      1) Perform flush-out using either Path 1 or Path 2.

         i. Path 1: After construction ends, prior to occupancy and with all interior finishes installed, install new filtration media and perform a building flush-out by supplying a total air volume of 14,000 cu.ft. of outdoor air per sq.ft. of floor area while maintaining an internal temperature of at least 60 degrees F and no higher than 80 degrees F and relative humidity no higher than 60%.

         ii. Path 2: If occupancy is desired prior to completion of the flush-out, the space may be occupied following delivery of a minimum of 3,500 cu.ft. of outdoor air per sq.ft. of floor area to the space. Once a space is occupied, it must be ventilated at a minimum rate of 0.30 cfm/sq.ft. of outside air or the design minimum outside air rate determined in IEQ Prerequisite: Minimum Indoor Air Quality Performance, whichever is greater. During each day of the flush-out period, ventilation must begin a minimum of three hours prior to occupancy and continue during occupancy. These conditions must be maintained until a total of 14,000 cu.ft./sq.ft. of outside air has been delivered to the space.

      2) Commissioning can occur during flush-out, at the discretion of the Commissioner, provided none of the commissioning procedures introduce contaminants into the space and none of the flush-out procedures circumvent the commissioning process. Complete testing and balancing of the HVAC system after the flush-out is complete. Refer to Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS.

      3) If even partial construction work occurs during the flush-out, the flush-out must be started again from the beginning for that space. If multiple, discrete HVAC systems operate independently, flush-out may be completed in portions of the building as work is completed in each area served by a given system.

   OR

   b. <u>OPTION 2 — Air Testing</u>

      1) Conduct baseline IAQ testing, after construction ends and prior to occupancy, using testing protocols consistent with current versions of the United States Environmental Protection Agency “Compendium of Methods for the Determination of Air Pollutants in Indoor Air” or ISO methods, as additionally detailed in the USGBC “LEED BD+C Reference Guide.”

2) Demonstrate that the contaminant maximum concentrations listed below are not exceeded.

CONTAMINANT	MAXIMUM CONCENTRATION
Formaldehyde	27 parts per billion
Particulates (PM10 for all buildings; PM25 for buildings in EPA nonattainment areas, or local equivalent)	PM10: 50 micrograms per cubic meter PM25: 15 micrograms per cubic meter
Ozone (for buildings in EPA nonattainment areas)	0.075 parts per million
Total Volatile Organic Compounds (TVOC)	500 micrograms per cubic meter
Target chemicals listed in the California Department of Public Health (CDPH) Standard Method c1.1, Table 4-1, except formaldehyde	CDPH Standard Method v1.1-2010, Allowable Concentrations, Table 4-1
Carbon Monoxide (CO)	9 part per million and no greater than 2 parts per million above outdoor levels

3) The air sample testing must be conducted as follows:

i. All measurements must be conducted prior to occupancy, but during normal occupied hours and with the building ventilation system starting at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the duration of the air testing.

ii. The building must have all interior finishes installed, including but not limited to millwork, doors, paint, carpet and acoustic tiles. Non-fixed furnishings such as workstations and partitions are required to be in place for the testing.

iii. Prior to air sample testing, all punch-list items that would generate VOCs or other contaminants, the testing and balancing of the HVAC system and finalization of all cleaning must be completed. Use low-emitting cleaning products and vacuum cleaners with HEPA filtration.

iv. The number of sampling locations will vary depending upon the size of the building and number of ventilation systems. For each portion of the building served by a separate ventilation system, the number of sampling points must not be less than one per 25,000 sq.ft., or for each contiguous floor area, whichever is larger, and include areas with the least ventilation and greatest presumed source strength.

v. Air samples must be collected between 3 feet and 6 feet from the floor to represent the breathing zone of occupants, and over a minimum 4-hour period.

vi. For each sampling point where the maximum concentration limits are exceeded, conduct additional flush-out with outside air and retest the specific parameter(s) exceeded to indicate the requirements are achieved. Repeat procedure until all requirements have been met. When retesting non-complying building areas, take samples from the same locations as in the first test.

6. Implementation and Coordination: Before Demolition and/or Construction begins, the Contractor must implement the Construction IAQ Management Plan, coordinate the Construction IAQ Management Plan with all affected trades, and designate one individual as the Construction IAQ Representative at no additional cost to the City of New York, who will be responsible for communicating the progress of the Construction IAQ Management Plan with the Commissioner monthly and for assembling the required LEED documentation. Include provisions in the Construction

IAQ Management Plan for addressing conditions in the field that do not adhere to the Plan, including provisions to implement a stop work order or to rectify non-compliant conditions.

a. Distribution: The Contractor must distribute copies of the Construction IAQ Management Plan in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

b. Instruction: The Contractor must provide on-site instruction of appropriate site management to all Contractor's Subcontractors.

c. Monitoring: The Construction IAQ Representative must monitor the implementation of the Construction IAQ Management Plan.

1.8 SUBMITTALS:

A. Submit the following LEED-required records and documents in accordance with Section 01 33 00 SUBMITTAL PROCEDURES and, as applicable, Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS or Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS.

B. A copy of the Construction IAQ Management Plan as defined in Sub-Section 1.7 herein.

C. IAQ Tracking Log
   1. Note date of observed major Construction IAQ issues, describe any damage, describe any repairs or maintenance of specific control measures performed and note responsible party.
   2. Note date and findings of weekly site review, describe any repairs or maintenance performed, and note responsible party. Provide date-stamped photographs, inspection reports or other recording processes.
   3. Submit log monthly.

D. Product cut-sheets for all filtration media used during construction and installed immediately prior to occupancy, with MERV values highlighted. Cut sheets must be submitted with the Contactor's or Subcontractor's "approved" stamp as confirmation that the products are the products installed on the Project.

E. PHOTOGRAPHS: Submit to the Commissioner a minimum of 18 photographs as required under the provision for special photographs, in accordance with Section 01 32 33 PHOTOGRAPHIC DOCUMENTATION, comprised of at least six photographs taken on three different occasions during construction of each IAQ measure. The photographs must document the implementation of the Construction IAQ Management Plan throughout the course of the Project construction. Examples include photographs of ductwork sealing and protection, temporary ventilation measures, and conditions of on-site materials storage (to prevent moisture damage). Photographs must include integral date stamping, and must be submitted with brief descriptions of the Construction IAQ Management Plan measure documented, or be referenced to Project meeting minutes or similar Project documents which reference to the Construction IAQ Management Plan measure documented.

F. A copy of the Project's "Testing, Adjusting and Balancing" (TAB) report, if applicable.

1.9 QUALITY ASSURANCE:

A. The Contractor will be responsible for preparing and implementing the Construction IAQ Management Plan and must coordinate and incorporate the work of its Subcontractors in the IAQ Management Plan. Include the Construction IAQ Management Plan requirements in contract agreements with Subcontractors. Familiarize Subcontractors with the Construction IAQ Management Plan and how the Construction IAQ Management Plan will affect their daily activities. Hold a Subcontractors' orientation meeting to review the Construction IAQ Management Plan requirements.

B. Responsibility of Subcontractors: Subcontractors for this Project will be responsible for cooperating with the Contractor in the preparation and implementation of the Construction IAQ Management Plan.

C. Include construction IAQ progress check-ins as a regular item in weekly Subcontractor meetings and safety meetings. Provide a copy of the plan on site, posted in an easily accessible area.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 81 19

SECTION 01 81 21

SUSTAINABLE CONSTRUCTION REQUIREMENTS

PART I - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section includes general requirements for sustainable construction.

1.3 DEFINITIONS

A. Embodied carbon: The greenhouse gas emissions arising from the manufacturing, transportation, installation, maintenance, and disposal of building materials.

B. Environmental Product Declaration (EPD): A third-party-verified International Organization for Standardization (ISO) Series 14025 Type III declaration that quantifies environmental information on the life cycle of a product to enable comparisons between products fulfilling the same function.

1.4 SUBMITTALS

A. EPDs: The Contractor must submit to the Commissioner copies of all EPD's submitted to the Building Transparency database per Subsection 1.5.C.

B. Low emission vehicles and equipment: The Contractor must submit to the Commissioner a log of all internal combustion engine (ICE) powered equipment used on the Project. The log must be submitted at Substantial Completion, and include:

a. The type of equipment (generator, excavator, crane, light tower, air compressor, etc.),
b. The fuel used by the ICE,
c. The engine size in horsepower (HP), and
d. If the equipment was provided by a Subcontractor, which one.

1.5 ENVIRONMENTAL PRODUCT DECLARATIONS

A. EPDs are required for the following materials, if used:

1. Steel materials:

a. 05 12 00 STRUCTURAL STEEL FRAMING

b. 05 12 13 ARCHITECTURALLY EXPOSED STRUCTURAL STEEL FRAMING

c. 05 21 00 STEEL JOIST FRAMING

d. 05 31 00 STEEL DECKING

e. 05 40 00 COLD-FORMED METAL FRAMING

f. 05 44 00 COLD FORMED METAL TRUSSES

2. Concrete materials:

a. 03 30 00 CAST-IN-PLACE CONCRETE

b. 03 38 16 UNBONDED POST-TENSIONED CONCRETE

c. 03 41 00 PRECAST STRUCTURAL CONCRETE

d. 03 45 00 PRECAST ARCHITECTURAL CONCRETE

e. 03 47 13 TILT-UP CONCRETE

B. If EPDs are available for materials not listed in subsection 1.5.A, they must be submitted.

C. EPDs must be submitted to the Building Transparency database, using the OpenEPD format, at https://buildingtransparency.org/ec3

1.6 LOW-EMISSION VEHICLES AND EQUIPMENT

A. The Contractor must endeavor to minimize the greenhouse gas emissions from the Contractor's equipment. To achieve this goal, the following is required:

1. Electric powered equipment is to be used where practical instead of internal combustion engine (ICE) powered equipment. The Contractor may refer to the NYC Department of Citywide Administrative Services (NYC DCAS) bi-annual publication, the Clean Fleet Transition Plan (https://www1.nyc.gov/site/dcas/agencies/fleet-sustainability.page), in order to determine what equipment is available.

2. Where ICE powered equipment is necessary, efforts should be taken to ensure the most efficient ICE engines are used. This may include:

a. The use of larger efficient ICE generators to power multiple pieces of electric equipment,
b. Reductions in the use of less than 50HP engines,
c. Use of lower emission or renewable fuels, such as biodiesel or CNG,
d. Use of hybrid electric equipment, and
e. Other innovative methods proposed by the Contractor.

3. The Contractor is required to coordinate between all Subcontractors and trades in order to reduce the number of ICE equipment and generators in use.

PART II - PRODUCTS (Not Used)

PART III - EXECUTION (Not Used)

END OF SECTION 01 81 21

SECTION 01 91 13
GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 91 13

PART I – GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. The OPR and BOD documents are included by reference for information only.

C. The Commissioning Plan, prepared by the Commissioning Agent (CxA) under separate contract with the City of New York, contains requirements that apply to this section.

1.2 SUMMARY:

A. This section includes general requirements that apply to implementation of Commissioning without regard to systems, subsystems and equipment being commissioned. General Requirements for building enclosure commissioning are addressed in a separate specification.

B. This Section includes:

1. Definitions
2. Commissioning Team
3. City's Responsibilities
4. Contractor's Responsibilities
5. CxA Responsibilities
6. Commissioning Documentation
7. Submittals
8. Coordination
9. Test Equipment
10. Commissioning Process
11. Commissioning Plan and Schedule
12. General Testing Requirements
13. Testing Procedures
14. Deficiencies
15. Operation & Maintenance Manuals
16. Demonstration and Instruction
17. Guaranty Review / Seasonal Testing
18. Record Drawings

1.3 RELATED SECTIONS:

A. System-Specific Commissioning requirements indicated in other sections of the Project Specifications for specific requirements for commissioning systems.

B. This Project will be commissioned by an independent third party under separate contract with the City of New York. Commissioning must be in accordance with ASHRAE and USGBC LEED procedures, and specific commissioning requirements of the Project Specifications, whichever is more stringent. The Contractor must cooperate with the CxA and provide whatever assistance is required.

C. Related sections include, without limitation, the following:
1. Section 01 10 00 SUMMARY
2. Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION
3. Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
4. Section 01 78 39 CONTRACT RECORD DOCUMENTS
5. Section 01 79 00 DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION
6. Section 01 81 13.03 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v3 BUILDINGS
7. Section 01 81 13.04 SUSTAINABLE DESIGN REQUIREMENTS FOR LEED v4 BUILDINGS
8. Section 01 91 15 GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE

1.4 DEFINITIONS:

A. Refer to Article 2 of the Contract for definition of terms, words and expressions used in the General Conditions not otherwise defined herein.

Basis of Design (BOD)	A document, prepared by the Design Consultant, that records concepts, calculations, decisions, and product selections used to meet the OPR and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.
Checklists	Forms that outline the step-by-step process that must be executed to fulfill the test requirements and to verify that materials, equipment, assemblies and systems are installed in accordance with the Contract Documents. The CxA must develop the checklists; the Contractor must complete them.
Construction Checklist	Form used by Contractor and the CxA to verify that appropriate work components for the Project are on-site, ready for installation, correctly installed, and functional.
Commissioning	Commissioning is a systematic process of ensuring and documenting that the building systems have been installed in the prescribed manner, are functionally checked and capable of being operated and maintained to perform with the design intent and have documentation to support proper installation and operation. The process does not eliminate or reduce the responsibility of the installing Subcontractors to provide a finished product.
Commissioning Agent (Aka Commissioning Authority) (CxA)	Consultant under separate contract with the City of New York to provide Commissioning services for this Project. The CxA must not be an employee of the Contractor, nor will the CxA have any interest in the Contract.
Commissioning Plan	A document developed by the CxA that outlines the organization, schedule, roles and responsibilities, allocation of resources, and documentation requirements of the commissioning process.
Deferred Performance Tests	Performance tests that are performed, at the discretion of the CxA, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design, or other site conditions that disallow the test from being performed.
Design Consultant	The entity responsible for providing design services for the Project, including without limitation, preparing the construction documents (drawings and Specifications) and providing services in connection with such documents during construction. The entity serving as the "Design Consultant" may be a corporation, firm, partnership, joint venture, individual or combination thereof. Such entity may be either an employee(s) of the City or an entity engaged by the City to provide such services.
Factory Testing	Testing of equipment on-site or at the factory, by factory personnel, with or without the City's representative.

Functional Performance Test (FPT)	Functional performance testing includes the dynamic functions and operations of equipment and systems using manual or monitoring methods under various levels of operation. Systems are tested under various modes, such as during low cooling loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarms, power failure, etc. The systems are run through all the control system's sequences of operation and components are verified to respond as the sequences state. Such tests must be performed as per the protocol written by the CxA which defines the methods, personnel and expectations.
Issue (or Deficiency)	A condition in the installation or function of a component, piece of equipment, or system that is not in compliance with the Contract Documents.
Issues Log	A formal and ongoing record of problems, deficiencies or concerns that have been raised by members of the Commissioning Team during the course of commissioning. The Issues Log is the primary tracking tool to address all Commissioning Issues by concerned parties. All Issues must be addressed and resolved by the concerned parties before the closeout of the Project. This log tracks the resolution performed and date of closure of each Issue.
Master Equipment List (MEL)	A complete listing of all commissioned building equipment, including details such as make, model, location, ID Tag number, etc. that is taken from submittals and is the basis from which checklists will be generated. The MEL is a spreadsheet which is also used as a tracking tool for all milestones of the commissioning process, such as the creation and performance of checklists, startup of equipment, TAB work, etc.
Monitoring	The recording of parameters (flow, current, status, pressure, etc.) of equipment operation using data loggers or the trending capabilities of control systems.
Owner (City of New York) Contracted Tests	Tests paid for by the City of New York outside of the Contractor's Contract and for which the CxA does not provide oversight. These tests will not be repeated during functional testing if properly documented.
Owner's Project Requirements (OPR)	A document, prepared by the Design Consultant that details the functional requirements of a Project and the expectations of how it will be used and operated. These include Project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information.
Pre-functional (Installation) Checklists	A list of items to inspect and elementary component tests to conduct to verify proper installation of equipment, provided by the CxA to the Contractor. Installation checklists are primarily static inspections and procedures to prepare equipment or systems for initial operation. Pre-functional (Installation) checklists augment, and are combined with, the manufacturer's startup checklist. The Checklists are filled out by the Contractor and reviewed by the CxA.
Sampling	Functional testing for a percentage of the total number of identical or near-identical pieces of equipment.
Seasonal Performance Tests	Functional tests that are deferred until, or performed again when, the system(s) will experience climate conditions close to their design conditions.
Startup	The initial starting or activating of equipment, including executing construction checklists.
Systems, Subsystems, Equipment, and Components	Where these terms are used together or separately, they mean "as-built" systems, subsystems, equipment, and components.

Systems Manual	A system-focused composite document that includes the Operation and Maintenance Manual, and additional information of use to the owner during the occupancy and operations phase.
Testing, Adjusting and Balancing (TAB)	Testing, adjusting, and balancing of the Heating Hot Water (HHW), Chilled Water (CHW) and Heating, Cooling, and Ventilation Airflow distribution system flows and pressures as specified in Contract Documents by a Subcontractor certified to perform such work.
Test Requirements	Requirements specifying what modes and functions, etc. must be tested on any given piece of equipment or any given system (integrated or standalone). The test requirements are not the detailed test procedures. The test requirements for each system are specified in the respective Contract Documents.
Trending	Monitoring using the building controls system, and analysis of the data gathered over a period of time.

1.5 COMMISSIONING TEAM:

A. Members Appointed by the Contractor and its Subcontractors: Individuals, each having authority to act on behalf of the entity he or she represents, explicitly organized to implement the Commissioning process through coordinated actions. The Commissioning Team will consist of, but not be limited to, representatives of the Contractor, including Project superintendent and Subcontractors, installers, suppliers and specialists deemed appropriate by the CxA.

B. Members Appointed by the City:

1. Commissioning Authority/Agent (CxA): The designated person, company, or entity under separate Contract with the City that plans, schedules and coordinates the Commissioning Team to implement the commissioning process.

2. Representatives of the facility user and operation and maintenance personnel.

3. Design Consultant and other concerned entities.

1.6 CITY'S RESPONSIBILITIES:

A. Provide the OPR and BOD documentation to the CxA for use in developing the Commissioning Plan; systems manual; operation and maintenance orientation plan; and testing plans and checklists.

B. Assign operation and maintenance personnel to participate in Commissioning Team activities.

C. Provide full details and results of any Owner- contracted tests relevant to the current Project.

1.7 CONTRACTOR'S RESPONSIBILITIES:

A. The Contractor must provide utility services required for the commissioning process.

B. As a member of the Commissioning Team, the Contractor and Subcontractors must assign representatives with expertise and authority to act on behalf of the Contractor and its Subcontractor and schedule them to participate in and perform Commissioning Team activities including, but not limited to, the following:

1. Participate in scheduled construction-phase coordination and Commissioning Team meetings.

2. Integrate and coordinate commissioning process activities with the construction schedule.

3. Provide all factory acceptance test reports to the CxA through the Commissioner.

4. Respond to any additional specific information requests from the CxA. CxA may request additional documentation necessary for the commissioning process. Requests by CxA may precede, be concurrent with, or follow normal submittals.

5. Ensure the cooperation and participation of all Subcontractors and manufacturers of equipment to be commissioned.
6. Verify and confirm that components, equipment, and system are functioning as per design prior to CxA witnessing testing.
7. Perform testing required in the Commissioning schedule as per the Commissioning process test procedures provided by the CxA, providing no less than 48 hours' notice to the CxA through the Commissioner.
8. Coordinate schedule with, and perform Cx activities at the direction of, CxA.
9. Provide technicians, instrumentation, tools, and equipment to perform and document the following:
   a. Cx Construction Checklist verification tests.
   b. Cx Construction Checklist verification test demonstrations.
10. Complete installation checklists as Work is completed and return to CxA through the Commissioner.
11. Provide written responses to the CxA through the Commissioner for resolution of Issues recorded in the Issues Log within five (5) business days.
12. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
13. Submit operation and maintenance manuals for systems and subsystems, and equipment in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS. Such documents must be submitted prior to functional testing.
14. Submit As-Built documents in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
15. Provide orientation sessions for operations and maintenance personnel (sessions will be witnessed by the CxA) in accordance with Section 01 79 00 DEMONSTRATION AND OWNER'S PRE-ACCEPTANCE ORIENTATION. Provide no less than 48 hours' notice to the CxA, through the Commissioner. Video record and edit orientation sessions and provide an electronic recording to the CxA and Commissioner no later than two (2) weeks after the orientation session occurs. Edit as requested by the Commissioner.
16. Provide information requested by the CxA for final commissioning documentation.
17. Provide measuring instruments and logging devices to record test data and provide data acquisition equipment to record data for the complete range of testing for the required test period.
18. Provide detailed startup procedures.
19. Provide a written list of all user adjustable set-points and reset schedules with a brief discussion of the purpose of each and the range of reasonable adjustments with energy implications.
20. Provide a written schedule frequency to review the various set-points and reset schedules to ensure they are current relevant and efficient values.
21. Respond to provided new deficiencies and/or responses within five (5) business days.
22. Gather operation and maintenance literature on all equipment, and assemble in binders as required by the Contract Documents. Submit to CxA 45 days after submittal acceptance.
23. Coordinate with the CxA to provide 48-hour advance notice so that the witnessing of equipment and system start-up and testing can begin.

24. Notify the CxA a minimum of two weeks in advance of the time for start of the testing and balancing work. Attend the initial testing and balancing meeting for review of the official testing and balancing procedures.

25. Provide written notification to the Commissioner and CxA that the following work has been completed in accordance with the Contract Documents, and that the equipment, systems, and sub-system are operating as required.

26. The equipment suppliers will document the performance of their equipment.

27. Provide a complete set of record drawings to the CxA prior to the start of Functional Performance Testing.

28. Contractor responsibilities to be completed by Equipment Suppliers:

    a. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the City of New York's personnel, to keep warranties in force.

    b. Assist in equipment testing.

    c. Provide information requested by CxA regarding equipment sequence of operation and testing procedures.

1.8 COMMISSIONING AGENT'S (CxA) RESPONSIBILITIES:

A. Organize and lead the Commissioning Team.

B. Prepare a construction-phase Commissioning Plan. Collaborate through the Commissioner with Contractor and with Subcontractors to develop test and inspection procedures. Include design changes and coordinate Commissioning activities with the overall Project schedule. Identify Commissioning Team member responsibilities, by name, firm, and trade specialty, for performance of each commissioning task. Update the Commissioning Plan during construction as required.

C. Review and comment in accordance with Section 01 33 00 SUBMITTAL PROCEDURES, on submittals from the Contractor for compliance with the OPR, BOD, Contract Documents, and construction-phase Commissioning Plan. Review and comment on performance expectations of systems and equipment and interface between systems relating to the OPR and BOD.

D. Coordinate with the Commissioner, in accordance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION, to convene Commissioning Team meetings for the purpose of coordination, communication and conflict resolution; discuss progress of the commissioning processes.

E. At the beginning of the construction phase, coordinate with the Commissioner's kick-off meeting schedule to conduct an initial construction-phase coordination meeting for the purpose of reviewing the Commissioning activities and establishing tentative schedules for operation and maintenance submittals, operation and maintenance orientation sessions, TAB Work, testing, and Project completion.

F. Perform site visits to observe and inspect construction as described in the Commissioning Plan. Report progress and deficiencies to the Commissioner. In addition to compliance with the OPR, BOD, and Contract Documents, inspect systems and equipment installation for adequate accessibility required for component maintenance replacement and repair.

G. Prepare and distribute project-specific test and inspection procedures and checklists and maintain MEL.

H. Verify air and water systems balancing by sampling, reviewing completed reports and selected site observation. Coordinate submittal reviews with the Commissioner so that the comments are combined into a single review and submitted to the Contractor.

I. Coordinate with the Commissioner to witness and document tests, inspections and systems startup, as per the Commissioning Plan.

J. Maintain an Issues Log and a record of functional testing. Report all Issues as they occur to the Commissioner.

K. Compile test data, inspection reports and certificates, and include them in the systems manual and Commissioning Report.

L. Certify date of acceptance and startup for each item of equipment for start of warranty periods.

M. Review and comment on operation and maintenance documentation and systems manual outline for compliance with the OPR, BOD, and Contract Documents. Operation and maintenance documentation requirements are specified in other sections of the Project Specifications and described in Section 01 78 39 CONTRACT RECORD DOCUMENTS.

N. Review agenda for orientation; witness and confirm orientation session conforms with agenda and Contract Documents; review recording of demonstration and orientation sessions provided by the Contractor on USB drive or other electronic media as requested by the Commissioner and provide appropriate comments for editing.

O. Return to the site ten (10) months into the twelve (12)-month guaranty period, to review with facility staff the current building operation and the condition of outstanding Issues related to the original and seasonal commissioning. Interview facility staff and identify problems or concerns they have with operating the building as originally intended.

P. Prepare Commissioning Reports.

Q. Assemble the final commissioning documentation, including the Commissioning Report and Systems Manual.

R. Perform all CxA tasks as defined by LEED and the NYC Energy Conservation Code; prepare LEED submittal documents and preliminary and final Commissioning Reports as required by the NYC Energy Conservation Code.

1.9 COMMISSIONING DOCUMENTATION:

The Contractor must assist the CxA in the development and compiling of the following Commissioning Documentation:

A. Index of Commissioning Documents: The CxA will prepare an index including the storage location of each document.

B. Commissioning Plan: A document prepared by the CxA that outlines the schedule, allocation of resources, roles and responsibilities, and documentation requirements of the Commissioning process. Within 30 days of receipt of the Commissioning Plan, the Contractor must review the plan and document any issues or concerns with RFIs in compliance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION.

C. Test Checklists: The CxA will develop test checklists for each system, subsystem, or equipment including interfaces and interlocks, and include a separate entry, with space for comments, for each item to be tested. The CxA will prepare separate checklists for each mode of operation and provide space to indicate whether the mode under test responded as required. Space will be provided for testing personnel to sign off on each checklist. Specific checklist content requirements are specified in other sections of the Project Specifications, but must include without limitation:

1. Identification of tested item
2. Date of test
3. Indication of whether the record is for a first test or retest following correction of a problem or Issue
4. Dated signatures of the person performing the test and of the witness if applicable

5. Deficiencies and Issues, if any, generated as a result of the test

D. Inspection Checklists will be signed by the Contractor, Subcontractor(s), Installer(s), and CxA certifying that systems, subsystems, equipment, and associated controls are ready for testing.

E. Test and Inspection Reports: The CxA will record test data, observations, and measurements on test checklists. Photographs, forms, and other means appropriate for the application will be included with data. CxA must compile test and inspection reports and test and inspection certificates and include them in systems manual and Commissioning Report.

F. Corrective Action Documents: The CxA will document corrective action taken for systems and equipment that fail tests and include required modifications to systems and equipment and revisions to test procedures, if any. The Contractor must retest systems and equipment requiring corrective action. The CxA will document retest results.

G. Issues Log: The CxA will prepare and maintain an Issues Log that describes design, installation, and performance Issues that are at variance with the OPR, BOD, and Contract Documents. The log will identify and track Issues as they are encountered, documenting the status of unresolved and resolved Issues. The Issues Log will identify, at a minimum:

1. The party responsible for correcting the Issue,
2. The person documenting the Issue resolution,
3. The exact location of the Issue (floor and room),
4. The applicable system component,
5. A detailed description of the Issue,
6. The Issue status, and
7. The date the Issue was discovered and the date the Issue was resolved.

H. Commissioning Report: The CxA will document results of the commissioning process including unresolved Issues and performance of systems, subsystems, and equipment. The Commissioning Report will indicate whether systems, subsystems, and equipment have been completed and are performing according to the OPR, BOD, and Contract Documents. The Commissioning Report must include:

1. An executive summary, including participants and their roles, a brief building description, an overview of the commissioning and testing scope, and a general description of testing and verification methods,
2. Installation/Pre-Functional Checklists,
3. Start-up reports,
4. Functional Test documentation,
5. Trend Log Analysis,
6. The final Issues Log, with all Issues identified through the commissioning process, identifying which, if any, Issues remain unresolved,
7. The Commissioning Plan,
8. Commissioning progress and field reports,
9. Commissioning review documents, and
10. Record of owner’s orientation.

I. Systems Manual: The CxA will gather required information and compile systems manual as specified in other sections of the Project Specifications and described in Section 01 78 39 CONTRACT RECORD DOCUMENTS.

1.10 SUBMITTALS:

A. Submittal of shop drawings, product data, samples, etc., relevant to commissioning must be provided to the CxA as requested. Such submittals must be in compliance with Section 01 33 00 SUBMITTAL PROCEDURES.

B. As-Built Contract Record Drawings and Operating and Maintenance Manuals relevant to commissioning must be provided to the CxA as requested. Such submittals must be in compliance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.

C. All demonstration and orientation submittals relevant to commissioning must be provided to the CxA as requested. Such submittals must be in compliance with Section 01 79 00 DEMONSTRATION AND OWNER'S PREACCEPTANCE ORIENTATION.

D. Completed Prefunctional (Installation) Checklists must be provided to the CxA prior to equipment startup.

1.11 COORDINATION:

A. Coordination of Commissioning is the responsibility of all Commissioning Team members.

B. Coordinating Meetings: The CxA will coordinate with the Commissioner's regularly scheduled construction progress meetings to conduct coordination meetings of the Commissioning Team to review progress on the Commissioning Plan, to discuss scheduling conflicts, and to discuss upcoming commissioning process activities. Commissioner and Contractor must ensure that all required Commissioning Team members attend.

C. Commissioning Kick-Off Meeting – Construction Team: The Contractor will attend a meeting of the Commissioning Team, chaired by the CxA, to review the scope of commissioning process activities and the Commissioning Plan with discussions on milestones, activities, and assignments of responsibilities. The flow and type of documents and the amount of submittal data given to the CxA will be determined. Meeting minutes will then be distributed to all parties by the CxA.

D. Commissioning Meetings: The Contractor will attend coordination meetings with the Commissioning Team, chaired by the CxA, to review progress on the Commissioning Plan, construction deficiencies, scheduling conflicts, and to discuss strategies and processes for upcoming commissioning process activities.

E. Miscellaneous Construction Meetings: The CxA attends selected planning and job-site meetings in order to remain informed on construction progress and to update parties involved in the commissioning process. This will not include 100% meeting attendance, but the CxA will be provided with the subsequent meeting minutes for review.

F. Construction Documents: The Contractor, through the Commissioner, will furnish copies of all construction documents, addenda, change orders and appropriate submittals and shop drawings to the CxA.

G. Pre-testing Meetings: The CxA will coordinate with the Commissioner to conduct pretest meetings of the Commissioning Team to review startup reports, pretest inspection results, testing procedures, testing personnel and instrumentation requirements, and manufacturers' authorized service representative services for each system, subsystem, equipment, and component to be tested. The Commissioner, Contractor, and all required Commissioning Team members will attend pretest meetings.

H. Testing Coordination: The Contractor will coordinate with testing personnel and agencies for timing and access for CxA to witness test. The CxA will advise the Commissioning Team as to the sequence of testing activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

I. Manufacturers' Field Services: The Contractor must coordinate manufacturers' field services, as per the Commissioning Plan.

J. The CxA will regularly apprise the Commissioner of progress, pending problems and/or disputes, as well as provide regular status reports on progress with each system.

PART II – PRODUCTS

2.1 TEST EQUIPMENT:

A. All industry standard test equipment required for performing the specific tests must be provided by the Contractor responsible for testing. Any proprietary Vendor-specific test equipment must be provided by that Vendor or Manufacturer.

B. Special equipment, tools, instruments, software, and equipment communication network access hardware and software (only available from Vendor, specific to the piece of equipment) required for testing equipment according to the Contract Documents must be included at no extra cost to the City and must be turned over to the City at Project close-out, except for stand-alone data logging equipment that may be used by the CxA.

C. Any portable or handheld setup and/or calibration devices required to initialize the control system must be made available by the control vendor for use by the CxA at no additional cost to the City.

D. The instrumentation used in the commissioning process must comply with the following:

1. Be of sufficient quality and accuracy to test and/or measure system performance within the tolerances required

2. Be calibrated at the manufacturer’s recommended intervals with calibration tags permanently affixed to the instrument

3. Be maintained in good repair and operating condition throughout use duration on this Project

4. Be immediately recalibrated or repaired if dropped and/or damaged in any way during this Project.

PART III – EXECUTION

3.1 COMMISSIONING PROCESS:

A. The following provides an overview of the Commissioning tasks during Project construction and the general order in which they occur.

1. Construction-phase Commissioning begins with a Commissioning Kickoff Meeting, conducted by the CxA through the Commissioner in accordance with section 01 31 00 PROJECT MANAGEMENT AND COORDINATION, where the Commissioning process is reviewed with all the Commissioning Team Members.

2. Additional meetings may be required throughout construction, scheduled by the CxA through the Commissioner in accordance with 01 31 00 PROJECT MANAGEMENT AND COORDINATION with necessary parties attending, to plan, scope, coordinate and schedule future activities and resolve open Issues.

3. The CxA will review the Contractor submittals concurrent with the Commissioner and provide comments to the Commissioner for inclusion in their review. The reviewed submittals will include all commissioned equipment information, including detailed startup procedures, and coordination drawings that include commissioned equipment and systems, control drawings and sequences, and interfaces and interlocks between systems.

4. The CxA works with the Commissioner and Contractor in developing Pre-functional and Functional Test documentation formats.

5. Periodically throughout the construction process, the CxA will perform site visits to observe component and system installations.

6. The checkout and performance verification generally proceeds from component level to equipment to systems and intersystem levels. Pre-functional (Installation) Checklists are to be completed before equipment startup. Equipment startup must be completed before TAB. TAB must be completed before the Functional Performance Checklists.

7. The Contractor must, with guidance from the CxA, execute and document the Pre-Functional (Installation) Checklists and perform startup and initial checkout of equipment and systems. The CxA documents that the checklists and startup are completed according to the approved plans. This will include the CxA witnessing selected assembly markups, portions of the startup of selected equipment, and spot checking the Pre-Functional (Installation) Checklists.

8. The CxA develops specific equipment and system Functional Checklists. The Contractor receives a copy of the procedure through the Commissioner. The CxA may request additional design narrative from the Commissioner and Controls Subcontractor, depending on the completeness of the Basis of Design and sequences provided within the design documents.

9. The Functional Checklists are executed by the Contractor and witnessed and documented by the CxA.

10. Items of non-compliance in material, installation startup, and operation are corrected and the equipment or system is rechecked. The CxA will maintain an Issues Log to track Issues and Issue resolution.

11. The CxA will review the operation & maintenance documentation for completeness.

12. Commissioning, excluding the Warranty Walkthrough and any seasonal testing at the written direction of the Commissioner, must be completed prior to Substantial Completion.

13. The CxA reviews the orientation documentation. The orientation schedules and agenda are provided by the Subcontractors. The CxA verifies that orientation is completed, attended by the appropriate City of New York personnel, is thorough and provides all necessary information required to operate and service the equipment or system.

14. Deferred testing/checkouts are conducted, as specified or required in the Contract Documents.

3.2 COMMISSIONING PLAN AND SCHEDULE:

A. Commissioning Plan: The Commissioning Plan provides guidance in the execution of the commissioning process. After the initial construction phase Commissioning kickoff meeting, the CxA will update the plan. This plan is a living document that must evolve and expand as the Project progresses. The Commissioning Plan must include:

1. Description of the facility and Project.

2. Description of the commissioning process and associated deliverable documents.

3. Description of equipment and systems to be commissioned.

4. Description of schedules for testing procedures along with identification of parties involved in performing and verifying tests.

5. Sample rates for equipment to be tested.

6. Identification of task items that must be completed before the next operation can proceed.
7. Description of responsibilities of Commissioning Team members.
8. Description of observations to be made and reported on during testing and witnessing of testing by all parties involved in the Project.

B. Commissioning Schedule: Contractor must provide construction schedules to the CxA, in accordance with Section 01 31 00 PROJECT MANAGEMENT AND COORDINATION. The CxA will develop and submit a schedule identifying the commissioning process and provide commissioning scheduling information to the Commissioner and Contractor for review and planning activities. The Contractor must incorporate the CxA's activities into the Project schedule.

3.3 GENERAL TESTING REQUIREMENTS:

A. Provide technicians, instrumentation, and tools to perform commissioning test at the direction of the CxA.

B. Tests will be performed using design conditions whenever possible.

C. Simulated conditions may need to be imposed using an artificial load when it is not practical to test under design conditions. Before simulating conditions, calibrate testing instruments. Provide equipment to simulate loads. Set simulated conditions as directed by the CxA and document simulated conditions and methods of simulation. After tests, return settings to normal operating conditions.

D. The CxA may direct that set points be altered when simulating conditions are not practical.

E. The CxA may direct that sensor values be altered with a signal generator when design or simulating conditions and altering set points are not practical.

F. If tests cannot be completed because of a deficiency outside the scope of the HVAC system, document the deficiency and report it to the Commissioner. After deficiencies are resolved, reschedule tests.

G. If the testing plan indicates specific seasonal testing, complete appropriate initial performance tests and documentation and schedule seasonal tests.

H. Refer to individual Commissioning specification sections for additional testing requirements.

3.4 TESTING PROCEDURES:

A. The CxA will determine and document the acceptance procedures for each system within disciplines. The acceptance procedures must incorporate the commissioning standards and successful testing results as referred to throughout the Specifications.

B. The CxA will provide performance checklists and performance checkout data sheets for each system based on actual system configuration. Special emphasis must be placed on checkout procedures that must conclusively determine actual system performance and compliance with the OPR and BoD.

C. The Contractor and appropriate Vendor(s) must be informed of what tests are to be performed and the expected results. The Commissioning Plan must address the test requirements and be distributed to all parties involved with that system.

D. Prior to Functional Testing, the Contractor must provide the following:

1. Contractor must certify in writing that commissioned systems, subsystems, and equipment have been installed, calibrated and started, and are operating according to the Contract Documents and approved submittals.

2. Contractor must certify in writing that all relevant instrumentation and control systems have been completed and calibrated,

3. Contractor must certify point-to-point checkout has been successfully completed, and that systems are operating in accordance with their design sequence of operation, Contract Documents, and approved submittals.

4. Contractor must certify that all sensors are operating within specified accuracy and all systems are set to and maintaining set points as required by the Contract Documents.

5. Contractor must certify in writing that TAB procedures have been completed, and that the TAB report has been submitted, discrepancies corrected, and corrective work approved.

6. Contractor must perform tests for system and intersystem performance only after CxA and Commissioner have approved the completed testing checklists for systems, subsystems, and equipment.

7. Contractor must inspect and verify the position of each device and interlock identified on checklists.

8. Contractor must check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.

9. Set systems, subsystems, and equipment into operating mode to be tested in accordance with approved test procedures (e.g., normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).

10. Contractor must install measuring instruments and logging devices to record test data as directed by the CxA.

E. The Functional Performance tests must be performed by the Contractor and Vendor(s) with oversight by the CxA. The CxA must witness, verify, and document these tests.

1. Functional Performance Tests must include operating the systems and components through each of the written sequences of operation, other significant modes of miscellaneous alarms, power failure, and security alarm when impacted by and interlocked with commissioned equipment, as detailed in the Commissioning Plan.

2. Checklists must be completed comprehensively and to the extent necessary to enable the CxA to assure the Commissioner that the systems perform as per the OPR, BOD, and Contract Documents.

3. If a test is failed for any reason and retesting is required, the Contractor must provide retesting at no additional cost to the City.

4. If a test must be witnessed more than twice by the Commissioning Agent due to repeated failure to perform as per the design documents, the Contractor must be responsible for the Commissioning Agent’s fee for witnessing repeated tests beyond the second incidence. Such fee will be negotiated between the Commissioning Agent and the Commissioner.

5. After testing, Contractor must return settings to normal operating conditions.

3.5 DEFICIENCIES:

A. Deficiencies/Non-Conformance.

1. The CxA will record the results of the functional test on the test form. All deficiencies or non-conformance items must be noted and reported to the Commissioner and the Contractor on a standardized form.

2. The Contractor must respond to new deficiencies within five (5) business days. The response must either indicate the issue will be corrected with anticipated date of completion indicated or the response should clearly indicate why the Contractor disputes the claim while referencing the Contract Documents in dispute or requesting further information to clarify the concern.

3. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CxA.

4. Every effort must be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures.

5. As tests progress and a deficiency is identified, the CxA discusses the issue with the Contractor.

6. When there is no dispute on the deficiency and the Contractor accepts responsibility to correct it, the CxA documents the deficiency and the Contractor's response and intentions or corrections. The CxA and Contractor then proceed to another test or sequence. Once the Contractor corrects the deficiency, the test is rescheduled and repeated in the anticipation of correct operation or function.

7. When there is a dispute about a deficiency, regarding whether it is a deficiency or who is responsible, the CxA documents the deficiency and the Contractor's response. The deficiency is then forwarded to parties assumed to be responsible for the deficiency. Resolutions are made at the lowest management level possible. Other parties are brought into the discussion as needed. Final interpretive authority is with the Commissioner. Final acceptance authority is with the Commissioner and CxA. The CxA will then document the resolution process. Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency. The CxA then reschedules the test as stated in the section above.

8. Deficiencies that are not corrected at the time of documentation, must be completed by the affected subcontractor and photo evidence of the deficiency resolution must be sent by the Contractor to both the Commissioner and the CxA.

B. Failure due to Manufacturer Defect.

1. The CxA and Commissioner will determine the equipment to be tested. If 10% of the equipment being tested, or three identical pieces of the equipment tested (irrespective of equipment unit size), whichever is greater, fail to perform due to manufacturing defect (mechanically or substantively), not allowing it to meet its submitted performance requirements, all identical pieces of equipment may be considered unacceptable by the CxA and the Commissioner. In such case, the Contractor must provide the Commissioner with the following:

   a. Within one week of notification from the Contractor, the manufacturer's representative will examine all other identical units making a record of the findings. The findings must be provided to the Commissioner within two weeks of the original notice.

b. Within two weeks of the original notification, the Contractor or manufacturer will provide a signed and dated written explanation of the problem, cause of failures, etc., and all proposed solutions which shall include full equipment submittals. The proposed solutions must not significantly exceed the specification requirements of the original installation.

c. Commissioner will determine whether a replacement of all identical units or a repair is acceptable.

d. Two examples of the proposed solution will be installed by the Contractor and the Contractor will be allowed to test the installations for up to one week, upon which the Commissioner will decide whether to accept the solution.

e. Upon acceptance, the Contractor and/or manufacturer must replace or repair all identical items, at their expense, and extend the manufacturer's warranty accordingly, if the original equipment warranty had begun. The replacement/repair work must proceed with reasonable speed beginning within one week from when parts can be obtained.

3.6 OPERATION & MAINTENANCE MANUALS:

A. General

1. The CxA must review the operation & maintenance manuals provided by the Contractor for completeness of the document. The review process will verify that operation & maintenance instructions meet Specifications and are included for all commissioned equipment furnished by the Contractor.

2. The CxA will communicate deficiencies in the manuals to the Contractor, or Commissioner, as requested. Upon a successful review of the corrections, the CxA recommends approval and acceptance of these sections of the operation & maintenance manuals to the Commissioner. The CxA also reviews each equipment warranty and verifies that all requirements to keep the warranty valid are clearly stated.

3. Published literature will be specifically oriented to the provided equipment, indicating required operation and maintenance procedures, parts lists, assembly / disassembly diagrams and related information.

4. The Contractor must incorporate the standard technical literature into system-specific formats for this facility as designed and as actually installed. The resulting operation & maintenance information must be system-specific, concise, to the point and tailored specifically to this facility. The CxA must review these documents as necessary for final corrections by the Contractor.

5. Contractor must submit operations & maintenance manuals for each piece of equipment for review no later than 45 days after submittal approval.

B. The operation & maintenance manual review and coordination efforts must be completed prior to Owner orientation sessions, as these documents are to be utilized in the orientation sessions.

C. System Operations Manual

1. The CxA must prepare and deliver these documents with inputs from the Contractor. The Contractor must provide all required documents to the CxA, through the Commissioner. The required documents must be described in the Commissioning Plan and Contract Documents. Typically, the manual includes the following:

a. System, subsystem, and equipment descriptions.

b. Commissioned systems single line diagrams (to be provided by Mechanical, Electrical, Plumbing, and Building Management System (BMS) Subcontractors).

c. As built sequences of operations, control drawings and original set points (to be provided by Design Consultant and BMS Subcontractor).

d. Operating instructions for integrated building systems (to be provided by Mechanical and BMS Subcontractors).

e. Recommended schedule of maintenance requirements and frequency (to be provided by Subcontractors).

f. Recommended schedule for calibrating sensors and actuators (to be provided by BMS Subcontractor).

3.7 DEMONSTRATION AND INSTRUCTION:

A. The Contractor must schedule and coordinate instruction sessions for the facility's staff for each commissioned system. Demonstrations must be held per Contract Documents, along with the appropriate schematics, handouts and visual / audio orientation aids onsite with equipment.

B. The equipment vendors must provide instruction on the specifics of each major equipment item including philosophy, troubleshooting and repair techniques.

C. The Contractor must record and edit demonstration and orientation sessions, and provide these records to the CxA, through the Commissioner.

D. For additional direction pertinent to instruction, refer to other specific specification sections for demonstration and instruction requirements.

E. The Contractor will be responsible for instruction coordination, scheduling, and completion of demonstrations and instructions.

F. The CxA will oversee the instruction of the City of New York's personnel for commissioned equipment and systems.

1. The CxA will interview the City of New York's personnel to determine the special needs and areas where instruction will be most valuable. The Commissioner and CxA will decide how rigorous the instruction should be for each piece of commissioned equipment. The CxA will communicate the results to the Contractor who will ensure participation by the Subcontractors.

2. In addition to these general requirements, the specific instruction requirements of the City of New York's personnel by the Contractor are specified in the DDC's General Conditions Section 017900 "Demonstration and Owners' Pre-Acceptance Orientation."

3. The Contractor must ensure that each Subcontractor and vendor responsible for instruction will submit a written instruction plan to the Contractor for review and approval prior to instruction. The Contractor will submit one comprehensive instruction plan to the CxA and the Commissioner.

4. The plan will be reviewed by the CxA and the Commissioner. Comments pertaining to its deficiencies will be forwarded to the Contractor. The instruction plan will be rewritten until approved by the CxA and the Commissioner. The final approved instruction plan will cover the following elements:

a. Equipment (included in instruction)

b. Intended audience

c. Location of instruction

d. Objectives

e. Subjects covered (description, duration of discussion, special methods, etc.)

f. Duration of instruction on each subject

g. Qualified instructor for each subject

h. Instructor qualifications

i. Methods (classroom lecture, video, site walk-through, actual operational demonstrations, written handouts, etc.)

5. Instruction documentation must include the following items:

a. Copy of the instruction plan, including schedule, syllabus, and agenda.

b. Copy of the Owner's Project Requirements.

c. Compiled operations manuals.

d. Compiled maintenance manuals.

e. Completed manufacturer instruction manuals.

f. Record drawings.

6. The CxA develops criteria for determining that the instruction was satisfactorily completed, including attending the instruction, etc. The CxA recommends approval of the instruction to the Commissioner using a standard form. The Commissioner signs the approval form/letter template.

7. At one of the instruction sessions, the CxA presents a presentation discussing the use of the blank functional test forms for re-commissioning equipment.

8. Video recording of the instruction sessions will be verified by the CxA in electronic format, at the discretion of the Commissioner.

3.8 GUARANTY REVIEW / SEASONAL TESTING

A. Seasonal Testing – During the twelve (12)-month guaranty period, seasonal testing (tests delayed until weather conditions are closer to the system's design) must be completed as part of this Contract. The CxA will coordinate this activity. Tests will be executed and documented, and deficiencies will be corrected by the Contractor, with facilities staff and the CxA witnessing. Any final adjustments to the operation & maintenance manuals and record documents due to seasonal testing will be made by the Contractor.

B. The CxA will return upon the start of the new season (cooling or heating) after Project completion to conduct performance tests that could not be performed due to ambient conditions. The seasonal testing will only be performed if suitable loads / conditions were unavailable during the performance testing stages (in other words; the requirement for testing is warranted), and at the written direction of the Commissioner.

C. The CxA will return to the site approximately ten (10) months into the twelve (12)-month guaranty period and interview the occupants and maintenance staff, review the operation of the building, provide recommendations for installation and operational problems and document guaranty and operational issues in the Issues database.

3.9 RECORD DRAWINGS

A. The CxA must review the as built Contract Documents to verify incorporation of both design changes and as-built construction details. Discrepancies noted must be corrected by the appropriate party.

END OF SECTION 01 91 13

SECTION 01 91 15
GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE

REFER TO THE ADDENDUM FOR APPLICABILITY OF THIS SECTION 01 91 15

PART I – GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum, and (5) the Contract [City of New York Standard Construction Contract].

B. The Owner's Project Requirements (OPR) and Basis of Design (BOD) documents are included by reference for information only.

C. The Commissioning Plan, prepared by the Commissioning Agent (CxA) under separate contract with the City of New York, contains requirements that apply to this section.

1.2 SECTION INCLUDES

A. This section includes the commissioning requirements for the Building Enclosure systems. Refer to "Exterior Enclosure Commissioning" in other sections of the Project Specifications for specific requirements regarding Building Enclosure Commissioning.

1. The commissioning requirements for the Building Enclosure systems given in this section are entirely separate from, and in addition to, the Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for this Project. The Contractor, and its Suppliers, Subcontractors, Vendors, etc., are required to participate in both commissioning processes as required.

1.3 DESCRIPTION

A. Building Enclosure Commissioning (BECx) is a systematic process of ensuring all building enclosure systems responsible for environmental separation perform as per the OPR and BOD. The BECx process is intended to verify and document proper installation and performance of building enclosure materials and systems in accordance with the Contract Documents.

B. Commissioning does not take away from, or reduce, the Contractor's responsibility to provide a finished and fully functioning product and installation.

C. This section will in no way diminish the responsibility of the Contractor in performing all aspects of work and testing as outlined in the Contract Documents. Any requirements outlined in this section are in addition to requirements outlined in the Contract Drawings and Specifications.

1.4 RELATED WORK

A. Specific BECx requirements are given in this Section. The following Project Specification sections are related to the commissioning work specified in this section:

1. Basic Concrete Requirements: Refer to Division 03
2. Basic Metal Requirements: Refer to Division 05
3. Basic Waterproofing, Roofing, Air Barrier and Insulation Requirements: Refer to Division 07
4. Basic Fenestrations Requirements: Refer to Division 08
5. Basic Finishing Requirements: Refer to Division 09

1.5 DEFINITIONS AND ABBREVIATIONS

A. Refer to Article 2 of the Contract and Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for terms, words, and expressions not otherwise defined herein.

Approval	Acceptance that a material or system has been properly installed and is functioning in tested modes according to the Contract Documents.
Building Enclosure Commissioning Agent (BECA)	BECA directs and coordinates day-to-day BECx commissioning activities.
Building Enclosure Testing Agency (BETA)	Building Enclosure Testing Agency whom is an independent agency retained by the Contractor and approved by the Commissioner, fully accredited by the appropriate governing body for each of the materials, components or systems to be tested or evaluated for compliance with requirements of the Contract Documents and as directed by the BECA. Documentation of such certification must be submitted to and approved by the Commissioner prior to the start of any work by the BETA.
Commissioning	Commissioning is a systematic process of ensuring and documenting that the building systems have been installed in the prescribed manner, are functionally checked and capable of being operated and maintained to perform with the design intent, and have documentation to support proper installation and operation. The process does not eliminate or reduce the responsibility of the installing Subcontractors to provide a finished product.
Commissioning Agent (CxA)	Refer to Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for Definition.
Commissioning Plan	Refer to Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for Definition.
Deficiency	Condition of a building enclosure material or system that is not in compliance with Contract Documents (that is, does not perform properly or does not comply with design intent).
Design Consultant	Refer to Section 01 91 13 GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS for Definition.
Simulated Condition	Condition created for testing component or system (e.g., applying pressure differential across the building enclosure concurrent with water spray to simulate a wind driven rain).
Mock-up	The activities where systems or materials are initially constructed and tested.

1.6 COORDINATION

A. Building Enclosure Commissioning Team: Members of the Building Enclosure Commissioning Team will consist of:

1. CxA
2. BECA
3. BETA
4. Commissioner
5. Contractor, and all Building Enclosure Subcontractors
6. Design Consultant

B. Management: City of New York will contract services of the BECA through a separate contract. The BECA will direct and coordinate commissioning activities and report to the Commissioner. All members of the

Building Enclosure Commissioning Team must cooperate to fulfill contracted responsibilities and objectives of the Contract Documents.

C. Scheduling: BECA must work with the Building Enclosure Commissioning Team to establish required commissioning activities to incorporate into the preliminary commissioning schedule. The Contractor must integrate commissioning activities into master construction schedule, in accordance with Section 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION. Necessary notifications are to be made in a timely manner in order to expedite commissioning.

1.7 SUBMITTALS

A. Contractor must provide documentation required for commissioning work in accordance with Section 01 33 00 SUBMITTAL PROCEDURES. At minimum, documentation must include, but not be limited to:

1. Submittal of shop drawings, product data, samples, etc., relevant to BECx and as requested by the BECA. Such submittals must be in compliance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
2. As-Built Record Drawings and Operation and Maintenance Information relevant to BECx and as required by the BECA. Such submittals must be in compliance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
3. All demonstration and orientation submittals relevant to BECx and as requested by the BECA. Such submittals must be in compliance with Section 01 79 00 DEMONSTRATION AND OWNER'S PREACCEPTANCE ORIENTATION.
4. Performance data, any performance test procedures, and installation and checkout materials.

B. The Contractor must provide all submittals to the Design Consultant, as per Section 01 33 00 SUBMITTAL PROCEDURES. The Design Consultant will transmit all building enclosure related submittals to the BECA for concurrent review.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION

3.1 SYSTEMS TO BE COMMISSIONED

A. Building Enclosure systems to be commissioned may include, but are not limited to, Roof waterproofing, including garden roof systems, all penetrations, and transitions; skylights and other sloped glazing; exterior walls, including the air barrier system, water management systems, and thermal insulation; punched windows, window walls, curtain walls, storefronts, glazed entries, doors, and louvers; sealants, expansion joints, and control joints; flashings, including all transitions and end-dams; terrace, balcony, and deck waterproofing; below-grade waterproofing, including drainage, waterproofing and damp proofing; below slab floor barriers; interface and transition conditions between exterior enclosure components and systems; smoke controls and fire separation and stopping; and any other special building enclosure systems, equipment, and controls. Refer to the Contract Documents for clarity.

3.2 RESPONSIBILITIES OF COMMISSIONING TEAM MEMBERS DURING CONSTRUCTION PHASE

A. Responsibilities of the Design Consultant include without limitation the following:

1. Review BECA comments on construction documents and shop drawings.
2. Assist in dispute resolution regarding building enclosure items.
3. Review BECA reports.
4. Incorporate BECA Submittal Review Comments into response on submittals.

B. Responsibilities of the BECA include the following without limitation:

1. Review and comment on Mock-up construction and testing plan as provided by Contractor.
2. Development of BECx Plan.
3. Review of building enclosure shop drawings and submittals, including “approved equal” requests, through the Commissioner in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.
4. Attend combined pre-construction and BECx kick-off meeting.
5. Develop construction checklists for the building enclosure for the Contractor’s use.
6. Observe the construction of a building enclosure Mock-up.
7. Witness the testing of a building enclosure Mock-up.
8. Project meetings / conference calls / coordination.
9. Field monitor installation of exterior enclosure components.
10. Update field report log.
11. Update BECx Plan.
12. Advise on Requests for Information.
13. Assist with the preparation of LEED paperwork.
14. Prepare systems manual, with required inputs and documentation from the Contractor in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
15. Complete Maintenance Plan, with required inputs and documentation from the Contractor in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
16. Prepare training manual, with required inputs and documentation from the Contractor in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
17. Prepare final BECx record and enclosure commissioning close-out documents.
18. Develop on-going BECx Plan.

C. Responsibilities of the Contractor and Building Enclosure Subcontractors include without limitation the following:

1. Review BECx Plan and FPT specification.
2. Attend commissioning kick-off meeting and other Building Enclosure Commissioning Team meetings.
3. Incorporate commissioning activities into the construction schedule.
4. Periodically update Commissioning activities in the construction schedule.
5. Notify Commissioner and BECA of work completion.
6. Verify building enclosure materials and assemblies are ready for functional testing.
7. Retain the services of an approved independent BETA; submit qualifications of independent BETA to Commissioner for approval; coordinate all activities and deliverables of this BETA; ensure all BETA deliverables are provided to the Building Enclosure Commissioning Team.
8. Attend all required material and systems testing.
9. Execute all periodic maintenance or repairs required on started systems from initial Mock-up of equipment to Final Acceptance by Commissioner to prevent material warranties from being voided.
10. Submit maintenance logs of all interim maintenance or repair tasks performed by Contractor.

11. Ensure installation work is complete, is in compliance with Contract Documents, and is ready for Functional Performance Testing. FPT test results will be documented by BECA.
12. Ensure resolution of non-compliance and deficiencies in construction or test results. Obtain written documentation of completion from the appropriate subcontractors.
13. Provide letters of compatibility for adjacent building enclosure materials and assemblies.
14. Facilitate all repairs and retesting of failed condition at no additional cost to the City of New York.
15. Provide all warranty information to BECA.

D. Responsibilities of the BETA include without limitation the following:

1. Attend Commissioning kick-off meeting and other Building Enclosure Commissioning Team meetings.
2. Provide on-site technician and equipment to complete Mock-up and field Functional Performance Testing.
3. Prepare and submit reports to the Commissioner at the conclusion of all testing.
4. Perform retesting and prepare corresponding reports.

3.3 BUILDING ENCLOSURE COMMISSIONING TEAM (BECx) MEETINGS

A. BECx meetings will be held periodically, as determined by the Commissioner and recommended by BECA.

B. Discussions held in BECx meetings must include, but not be limited to: system/materials, mock-up/field, progress, scheduling, testing, documentation, deficiencies, and problem resolution.

C. The Contractor must attend BECx meetings, and must ensure the attendance of required subcontractors, as requested.

3.4 REPORTING

A. BECA will provide status reports to the Commissioner. The Commissioner will provide such status reports to the Contactor, CxA, Design Consultant, and other entities as needed.

B. BECA will submit non-compliance and deficiency reports to Commissioner. The Commissioner will provide such reports to the Contractor, CxA, Design Consultant, and other entities as needed.

C. BECA will provide a final summary report to Commissioner and CxA.

3.5 MOCK-UP AND FINAL CONSTRUCTION

A. Prior to Functional Performance Testing or concealment of functional performance layers within the building enclosure, the Contractor must verify that all assemblies are complete, including deficiency long items, and all Contract requirements are met.

3.6 FUNCTIONAL PERFORMANCE TESTING

A. Objectives and Scope

1. The objective of Functional Performance Testing is to demonstrate that the building enclosure is performing according to documented design intent and Contract Documents. Functional Performance Testing ensures and documents that the building enclosure systems are fully operational. Additionally, during Functional Performance Testing, areas of deficient performance are identified and corrected, improving building enclosure system performance.

B. Development of Test Procedures

1. The purpose of a specific test is to verify and document compliance of the installed enclosure systems with the OPR. Building Enclosure Functional Performance Test Protocols are provided in other sections of the Project Specifications for specific requirements regarding BECx.

C. Coordination and Scheduling

1. Contractor must provide sufficient notice to BECA, through the Commissioner, regarding completion schedule for materials and systems. Testing to be performed in conjunction with site visits. Contractor must schedule Functional Performance Tests with Commissioning Team. BECA must witness and document functional testing of equipment and systems. BETA, as retained by the Contractor, must execute tests under direction of BECA.
2. Successful completion of Mock-up functional performance testing must occur prior to full production installation of building enclosure materials and systems.

3.7 DOCUMENTATION, NON-CONFORMANCE, AND APPROVAL OF TESTS

A. Documentation

1. BECA must witness and document results of FPT.

B. Non-Conformance

1. BECA must record results of functional testing. Deficiency or non-conformance issues must be noted and reported to the Commissioner. The Commissioner must provide such non-conformance reports to the CxA, Design Consultant, Contractor, and other entities, as needed.
2. Corrections of minor deficiencies identified may be made during tests at the discretion of the Commissioner and as recommended by the BECA. In such cases, deficiency and resolution must be documented.
3. Every effort must be made to expedite testing and minimize unnecessary delays, while not compromising integrity of tests.
4. Deficiencies are handled in the following manner:
   a) BECA documents deficiencies and notes Contractor's response and intentions. A finding of deficiency will not end the testing process.
   b) BECA submits deficiency report to the Commissioner. The Commissioner will provide such deficiency report to the CxA, Contractor, Design Consultant, and other entities as required.
   c) Contractor corrects deficiency and certifies that material or assembly is ready to be retested.
   d) Contractor informs Commissioner of retesting schedule for coordination with the BECA.
   e) Contractor reschedules test with the Commissioner and BETA at no additional cost to the City of New York.
   f) If a test must be witnessed more than twice by the BECA due to repeated failure to perform as per the design documents, the Contractor must be responsible for the BECA's fee for witnessing repeated tests beyond the second incidence. Such fee will be negotiated between the BECA and the Commissioner.

C. Testing

1. Costs for all testing and retesting required for the Project will be the responsibility of the Contractor. The Contractor is to provide access to the test specimens to the Commissioning Team, through the Commissioner.

3.8 COMMISSIONING DOCUMENTATION

A. Final Report Details

1. Final BECx Report must include an executive summary, list of participants and roles, brief building description, overview of Commissioning and testing scope, and general description of testing and verification methods. Report must contain evaluation regarding:
   a) Conformance to Specifications and design intent.
   b) Material/system installation.
   c) Functional performance.
2. All outstanding non-compliance items must be specifically listed.
3. Recommendations for improvement to system or operations, future actions, etc. must also be listed.

END OF SECTION 01 91 15

FMS ID: **LQASADA**

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS

30-30 THOMSON AVENUE LONG ISLAND CITY, NEW YORK 11101-3045
TELEPHONE (718) 391-1000 WEBSITE www.nyc.gov/ddc

Department of Design and Construction

Contract for Furnishing all Labor and Material Necessary and Required for:

CONTRACT NO. 1 GENERAL CONSTRUCTION WORK

Astoria Branch Library Renovation

LOCATION: **14-01 Astoria Boulevard**
BOROUGH: **Queens, NY 11102**
CITY OF NEW YORK

Contractor

Dated _____ , 20 _____

Approved as to Form
Certified as to Legal Authority

Acting Corporation Counsel

Dated _____ , 20 _____

Entered in the Comptroller's Office

First Assistant Bookkeeper

Dated _____ , 20 _____

Department of Design and Construction

PROJECT ID: **LQASADA**

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS

30-30 THOMSON AVENUE
LONG ISLAND CITY, NEW YORK 11101-3045
TELEPHONE (718) 391-1000
WEBSITE www.nyc.gov/ddc

VOLUME 3 OF 3

ADDENDUM TO THE GENERAL CONDITIONS

SPECIFICATIONS

FOR FURNISHING ALL LABOR AND MATERIALS
NECESSARY AND REQUIRED FOR:

Astoria Branch Library Renovation

LOCATION: **14-01 Astoria Boulevard**
BOROUGH: **Queens, NY 11102**
CITY OF NEW YORK

CONTRACT NO. 1 **GENERAL CONSTRUCTION WORK**

Queens Public Library

Yoshihara Mckee Architects

Date: **December 3, 2024**

CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS

ADDENDA CONTROL SHEET

BID SUBMISSION DATE/ TIME: March 20, 2025; between 11:30am and 2:00pm
BID OPENING DATE/ TIME: March 20, 2025; 2:30pm

PROJECT No. : **LQASADA**

TITLE: **Astoria Branch Library Renovation**

ADDENDA ISSUED	NO. OF DWG	DATE	APPROVED BY: ARCHITECTURE/ ENGINEERING	GENERAL COUNSEL
#1 Revised Bid Opening Date		2/24/25	kh	NA

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS

February 24, 2025

ADDENDUM No. # 1

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

85025B0031 – LQASADA

Astoria Branch Library Renovation

This addendum is issued for the purpose of amending the requirements of the Bid and Contract Documents and is hereby made a part of said Bid and Contract Documents to the same extent as though it were originally included therein.

The bidder is advised that the items listed below apply to the project:

1. **The Bid Opening for the contract described below scheduled for February 26, 2025, at 2:30 pm is rescheduled to March 20, 2025 at 2:30 pm.**

   Contract #1 – General Construction Work

2. **Bidders Questions and Responses to Questions:**
   See Attachment A. (Not Used)

3. **Revisions to Documents:**
   See Attachment B. (Not Used)

4. **Revisions to PASSPort forms:**
   See Attachment C.

Transferring Data Between Rounds of an RFX: A new document titled "Transferring Data Between Rounds of an RFX" has been added to the Documents section of the View RFx tab. Please refer to this document when an addendum has been issued. Note: Whenever an addendum is issued, the RFX item grid will be cleared. You can import the work you have already done by following the steps on this document.

DDC strongly advises vendors to finalize and submit bids 48 hours prior to due date and time. The City is not responsible for technical issues (e.g. internet connection, power outages, technology malfunction, computer errors, etc.) related to bid submissions.

If additional information is required, please contact the Department of Design and Construction, Contract Section via PASSPort (in the Discussions with Buyer section).

Sarah Zomick for

Richard Jones, PE CWI
Executive Director, Specifications

DDC PROJECT #: **LQASADA**

PROJECT NAME: **Astoria Branch Library Renovation**

ATTACHMENT A - BIDDERS QUESTIONS AND DDC RESPONSES

NOT USED

DDC PROJECT #: **LQASADA**

PROJECT NAME: **Astoria Branch Library Renovation**

ATTACHMENT B – REVISIONS TO THE DOCUMENTS

NOT USED

DDC PROJECT #: **LQASADA**

PROJECT NAME: **Astoria Branch Library Renovation**

ATTACHMENT C – REVISIONS TO PASSPORT FORMS

This Addendum initiates Round 2 of the procurement.

Please note that numbering of addenda is independent of rounds.

Bid Opening Date Changes:

The Bid Opening scheduled for February 26, 2025 at 2:30pm is rescheduled for March 20, 2025 at 2:30pm.

Questionnaire Changes:

None

Item Grid Changes:

None

CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS

ADDENDA CONTROL SHEET

BID SUBMISSION DATE/ TIME: March 20, 2025; between 11:30am and 2:00pm
BID OPENING DATE/ TIME: March 20, 2025; 2:30pm

PROJECT No. : **LQASADA**

TITLE: **Astoria Branch Library Renovation**

ADDENDA ISSUED	NO. OF DWG	DATE	APPROVED BY: ARCHITECTURE/ ENGINEERING	GENERAL COUNSEL
#1 Revised Bid Opening Date		2/24/25		
#2 Questions from Bidders and Responses to Questions; Revisions to Documents; Revisions to PASSPort Forms		3/3/25	BB	CL

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS

March 3, 2025

ADDENDUM No. # 2

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

85025B0031 – LQASADA

Astoria Branch Library Renovation

This addendum is issued for the purpose of amending the requirements of the Bid and Contract Documents and is hereby made a part of said Bid and Contract Documents to the same extent as though it were originally included therein.

The bidder is advised that the items listed below apply to the project:

1. **Bidders Questions and Responses to Questions:**
   See Attachment A.

2. **Revisions to Documents:**
   See Attachment B.

3. **Revisions to PASSPort forms:**
   See Attachment C.

Transferring Data Between Rounds of an RFX: A new document titled "Transferring Data Between Rounds of an RFX" has been added to the Documents section of the View RFx tab. Please refer to this document when an addendum has been issued. Note: Whenever an addendum is issued, the RFX item grid will be cleared. You can import the work you have already done by following the steps on this document.

DDC strongly advises vendors to finalize and submit bids 48 hours prior to due date and time. The City is not responsible for technical issues (e.g. internet connection, power outages, technology malfunction, computer errors, etc.) related to bid submissions.

If additional information is required, please contact the Department of Design and Construction, Contract Section via PASSPort (in the Discussions with Buyer section).

Richard Jones, PE CWI
Executive Director, Specifications

DDC PROJECT #: **LQASADA**

PROJECT NAME: **Astoria Branch Library Renovation**

ATTACHMENT A - BIDDERS QUESTIONS AND DDC RESPONSES

No.	Bidders Questions	DDC Responses
1	Could you please provide the name of the fire alarm vendor? Is this system new or existing?	The project is a gut renovation. The existing system is being completely removed. A new FA system is to be installed. Drawing DFA101, 102, 103 note that all fire alarm devices are to be removed. Specification section 284620 Fire Alarm Part-2, 2.1 Manufacturer: A. Sole Source Manufacturer: Edwards Systems Technology. The contractor is responsible to hire an FA vendor meeting the requirements of the Bid Documents and to coordinate the transfer of completed FA system to the sponsor agency.
2	As per Drawing H-002, wall plaster is removed from existing walls; in addition, according to Drawing LR-04, lead paint is removed from same plaster of walls. Both have their own prices for removal. Please clarify whether you want removal of paint and plaster separately, or plaster only as paint will be removed with plaster?	Removal of the plaster only as the paint will be removed with the plaster. The contractor must ensure proper bagging and disposal of these hazardous materials.
3	As per Drawing H-002, ceiling plaster is removed; in addition, according to Drawing LR-04, lead paint is removed from same ceiling plaster. Both have their own prices for removal. Please clarify whether you want removal of paint and plaster separately or plaster only as paint will be removed with plaster?	Removal of the plaster only as the paint will be removed with the plaster. The contractor must ensure proper bagging and disposal of these hazardous materials.
4	Please confirm if spray fireproofing is required underside of mezzanine metal deck?	Spray fireproofing is not required on the underside of the mezzanine metal deck; it is required on the steel beams that are part of the assembly.
5	As per Drawings A-501 thru A-504, details show the existing wall plaster to be patched and repaired, but no clear information of patching of wall is shown. Please show the extent of wall plaster needed to be patched and repaired or provide the quantity for bidding purpose.	See quantity on Drawing A-901.
6	As per Drawing A-102, shaft wall at openings at mezzanine level is tagged as 2.2, but no detail of shaft wall type 2.2 is given at partition details on Drawing A-901 Please clarify the shaft wall type as per A-901 or give details of 2.2 type shaft wall.	Wall tag at shaft has been revised to 2.1 on Drawing A-102. See updated Drawing, included with this Addendum.
7	No work is shown related to the gypsum plastering. Please explain the purpose of this division or show the extent of work.	Refer to specification section 092300 Gypsum Plastering, which includes the cutting, restoring and matching existing conditions, including plaster moldings and decorative trim. Also see interior elevations.

8	Re: L-501, there is discrepancy between quantities as per planting schedule and legends marked on the Drawings. For example, as per planting schedule, the quantity for 'Creeping Lily Turf' is 376 EA, but as per tag (Li) on 1,3/L-501, the quantity is 475 EA, and as per legend, the quantity is 390 EA. Please clarify which quantity would govern for bidding purposes.	The quantity of Creeping Lily Turf (Li) has been revised to 390 in the planting schedules on Drawings L-500 and L-501. Refer to updated Drawings, included with this Addendum.
9	Re: Drawing A-508, Detail 1; What is the difference from LVT-1 rooms 011 & 013, and LVT-1 pattern rooms 012 and 017. Are they all LVT-1?	The pattern in rooms 013, 012, 017 and 011 is composed of 3 tile colors. Drawing A-508 has been revised to show the pattern. Refer to updated Drawing, included with this Addendum.
10	Will the all new flooring require self-level underlayment for this bid scope?	Yes.
11	What is the average thickness of the self-level underlayment for this bid scope?	The thickness varies from 2” to 1/4”.
12	Is the basement on a slab or below grade?	The basement is located below the main grade level.
13	Does the basement have an existing moisture vapor membrane? Is it 100% intact?	Assume there is an existing vapor barrier, for bidding purposes. Contractor to verify in field.
14	Will the basement have a moisture vapor epoxy applied prior to self-level underlayment as part of this bid scope?	No, a moisture barrier at the existing basement is not part of the scope of the project.
15	Please provide a specification section for SH-1 Rubber.	Refer to specification section 096500 Article 2.3 for this information.
16	Please provide a specification section for VCT-1 Premium Excelon (or equal) for style.	Refer to specification section 096500 Article 2.1 for this information.
17	Will the electric closet in the YALP classroom have the same carpet tile finish as the room?	Yes, inside of closet to receive the same finish as the room it serves.
18	Will the electric closet in the YALP classroom have rubber cove base?	Yes.
19	Please confirm that there are no diagonal flooring layouts for LVT or carpet tile required for this bid scope.	Confirmed. No diagonal layouts are required. Refer to Drawing A-508 for clarification.
20	Please confirm that there are no ashlar flooring layouts for LVT or carpet tile required for this bid scope.	Confirmed. There are no Ashlar layouts for the LVT or carpet tile. Refer to Drawing A-508 for layouts.
21	Please confirm that the new entrance vestibule at basement elevation +24-9.5" on Drawing A-100 is Polished Concrete Floor.	This entry is at the level of the new addition. It is polished concrete.
22	Please confirm that there is no SH-2 work on stringers of Stair A.	Confirmed. No SH-2 is required on existing Stair A; the stringers are painted steel.
23	Carpet Tile CT-1 and CT-1 labeled 24" x 24" on Drawing A-901 appears to be 50cm x 50cm. Please confirm 50cm x 50cm is allowed for this bid scope.	50cm x 50cm is allowed for this bid scope. Refer to revised Drawing A-901, included with this Addendum.
24	Please confirm the existing steps/ risers of stair A will not require concrete repair for installation of SH-2 for this bid scope.	It is not anticipated that the concrete below the existing rubber tread will require repair.

25	Please provide these missing Division 8 Specifications: 08 80 00 Glazing, 08 81 26 Interior Glass Glazing, and 08 83 00 Mirrors.	These specifications are included in Volume 3 of the Bid Documents.
26	The following Division 9 specification sections listed in Table of Contents are missing: 09 51 13 Acoustical Panel Ceilings 09 54 23 Linear Metal Ceilings 09 65 00 Resilient Floorings 09 65 13 Resilient Base & Accessories 09 67 13 Resinous Flooring 09 68 13 Tile Carpeting Please advise.	These specifications are included in Volume 3 of the Bid Documents.
27	There doesn't appear to be a signage package, even though it's mentioned in several drawings. It's also difficult to tell if certain areas have existing signage, as this project involves mostly demolition and alterations. Could you please confirm if the signage package is part of the project scope? If it is, please provide more details on the signage locations, plans, and schedules. Having this information will help us ensure everything is properly arranged to meet the project's needs.	Yes, a signage package is part of the project scope. Refer to signage Drawings, included with this Addendum.
28	Interface LVT-2 Aries is discontinued as per Interface, please provide a substitute for this bid scope.	Refer to updated Drawing A-901, as well as updated specification section 096500, included with this Addendum, for revised tile.
29	Please confirm that the library will be closed to the public during construction.	Confirmed.
30	Per the Addendum to General Conditions provided in Volume 3, Section 018113.04 will apply. This specification requires regionally manufactured materials and regionally extracted, harvested, or recovered materials within a radius of 100 miles from the Project site. Please clarify which materials that this applies to since not all the materials specified for the project may be available within a radius of 100 miles.	No specific materials are targeted or mandated to be procured within 100-mile radius. If any of the procured materials happen to be regionally manufactured and sourced within 100 miles, these would be accounted towards the associated LEED Credits.
31	Page 8 of 28 of the Addendum to the General Conditions indicates that a Project Safety Representative must be provided. Please advise if the Project Safety Representative can also be the Project Superintendent assigned to the project, or if it needs to be a different person?	This can be the same person.
32	Please clarify where specification section 101100 Visual Display Units is applicable.	Per 101100, Article 1.2A, section includes field assembled bulletin boards (tackable wall surfaces). These are shown on Drawing A-501 in the Children's Reading Room.
33	Drawing DM-100 Existing Basement Plan calls for concrete foundation wall to be removed. What is the size and how deep is the concrete foundation wall?	Existing drawings indicate the concrete foundation wall extends to 4'-0" below grade.
34	Drawing L-100 calls for the existing brick retaining wall to be removed. What is the height of this wall?	Refer to Drawing G-001 for existing wall heights.

35	Drawings DM-200 and L-100 call for the existing exterior fence to be removed. Is this a steel picket fence? What is the height of the fence?	Existing picket steel fence heights are shown on the survey sheet G-001.
36	Please advise if the Elevator Machine Room on Drawing A-110 Basement RCP is going to receive GWB with acoustic insulation or remaining as underside of structure paint.	Elevator machine room to receive acoustic insulation on the underside of painted structure. See detail 1 Drawing A-602 for this information.
37	Drawing P-003 shows the invert elevation for the sanitary house trap as 15.46 feet, whereas drawing P-102 shows the invert as 19.45 feet. Which is the correct invert elevation?	The correct invert elevation at the sanitary house trap is 19.76. Refer to updated Drawing P-003, included with this Addendum.
38	Specification section 089119 notes to provide Model RS2300 louver (or equal). However, Drawing A-400 shows an existing louver to remain. Is there a proposed new louver for the project?	Yes. Drawing A-410 indicates louver RL-1, a new louver on the addition.
39	Drawing A-101 calls out for the HW tank concrete pad as 6" thick, whereas Drawing P200 shows the concrete pad as 4”. Please advise.	Concrete pad revised to 4” as per P-200 on Drawing A-101. Refer to updated Drawing, included with this Addendum.
40	What is the size of the structural channels shown on Drawing A-560, detail 5?	Refer to Drawing S-101 for steel channel sizes.
41	Drawing A-102 shows a type 2.2 wall. Drawing A-901 does not show a type 2.2 partition detail. Should this be a type 0.2 wall? Please advise.	Wall tag at shaft to be revised to 2.1 on Drawing A-102. Refer to updated Drawing, included with this Addendum.
42	Various notes throughout the Drawings, including but not limited to A-100 thru A-102, indicate that the bookshelves are not in contract. The details on Drawing A-903 also indicate “BOOKSHELF NIC.” Please advise who is responsible to provide and install the furniture linoleum on wood countertop over the bookshelves.	The furniture linoleum and wood countertops are to be provided as part of this contract.
43	Please clarify the trenching to be infilled shown on Drawing A-508. The legend is similar to the column line legend and difficult to distinguish. Also please confirm if the trenching is existing or if it is created by the Contractor in coordination with the basement underground plumbing plan on Drawing P-103.	The line type is different than the column grid line. Trenching is to be created by the Contractor in coordination with the basement underground plumbing plan on Drawing P-103.
44	Please advise who is responsible to provide chairs, tables, and shelves indicated on the Furniture Schedule on Drawings F-101, F-102, and F-103.	The furniture Drawings F-101, F-102 and F-103 are provided for information only and not part of this contract.
45	Drawing A-504 states “signage provided by others installed under this contract see 6/A560”. Please confirm that this is the only sign to install.	Refer to signage package, included with this Addendum, for complete scope.
46	Note 9 on Drawing M-104 states to clean, repair, and seal all existing ductwork. Please provide the layout of the ductwork to which this note applies.	This note applies to existing plenum that is being reutilized for tying in new toiler exhaust fan TX-1. Refer to updated Drawings M-104, included with this Addendum.

47	Please advise if there is a specific existing building BMS vendor for this project.	There is no existing BMS in the building and associated BMS vendor.
48	Re: Drawing A-901 partition schedules, wall types EX1, EX3, EX4, and EX5. Is the mentioned plaster finish an existing or proposed finish?	The plaster finishes on EX1, EX3, EX4 and EX5 are existing.
49	On Drawing A-103 Attic Plan, the schedule 40 threaded pipe rail is called out as 1-1/2" diameter, whereas on Drawing A-507 it is called out as 2" diameter. Please advise.	A-103 is correct. See revised Drawing A-507, included with this Addendum, for clarification.
50	Drawing A-550 detail 1 shows metal straps support for the light cove. What is the material and the thickness of the straps?	See revised Drawing A-550, included with this Addendum, for clarification.
51	Please provide the AV equipment list in excel in order to price the AV scope of work.	Refer to the Bid Documents, including the Proprietary Items List, for this information. Separate excel list cannot be provided.
52	Since the request has 3D Liquid Line, a staircase and EMs, we will most definitely need up to date CADs and an RCP to request drawings from our team, before being able to quote.	Please use drawing A-505 for layout of fixture BS-1 and BS-1EM.
53	On Drawing A-901, the Finish Schedule calls for Powerline Imports Tile Contempo 8"x20" matte white (or equal). The specified supplier /manufacturer advised us that the Contempo series has been discontinued, and the amount of stock left isn't enough to cover what is needed for the scope of this project. The supplier recommended a close substitute, which is the Studio White 4"x16". They also advised that they didn't have anything in an 8"x20" size. Please advise.	Refer to updated Drawing A-901, as well as revised specification section 093000, included with this Addendum, for revised tile.
54	On Drawing A-901, the Finish Schedule calls for (T-1) to be Porcelanosa Ibiza 4"x16" White Gloss, Grey Gloss, & Dark Gloss. The supplier/ manufacturer advised us that the approved specified material for this project is the 5"x17" Trend Snow. Please advise.	Refer to updated Drawing A-901, included with this Addendum, for revised tile.
55	Please clarify the material on the Stair A landing area & entrance vestibule landing area. SH-2 only mentions treads and risers. Is this perhaps a tile product? Please advise.	Refer to specification section 096500 Resilient Flooring for this information.
56	Shaw LVT-1 0551V- Level is discontinued as per Shaw Contract, please provide a substitute for this bid scope.	Refer to updated Drawing A-901, as well as revised specification section 096500, included with this Addendum, for revised tile.

DDC PROJECT #: **LQASADA**

PROJECT NAME: **Astoria Branch Library Renovation**

ATTACHMENT B – REVISIONS TO THE DOCUMENTS

Revisions to the Bid Drawings:

1. Drawing A-101 has been updated. Changes include:
    a. Revising thickness of concrete slab to 4”
2. Drawing A-102 has been updated. Changes include:
    a. Revising wall tag from 2.2 to 2.1.
3. Drawing A-507 has been updated. Changes include:
    a. Size of handrail piping to be 1-1/2”.
4. Drawing A-508 has been updated. Changes include:
    a. Drawing of 2 color floor patterns at basement level added.
5. Drawing A-550 has been updated. Changes include:
    a. Metal strap in detail 1 is 16 gauge.
6. Drawing A-901 has been updated. Changes include:
    a. LVT-1 revised.
    b. LVT-2 revised.
    c. CT-1 and 2 size revised.
    d. T-1 revised.
    e. T-2 revised.
    f. Existing plaster finish noted.
    g. Quantity of plaster patching/repair noted.
7. Drawing L-500 has been updated. Changes include:
    a. Updated quantity of Lilly Turf (LI).
8. Drawing L-501 has been updated. Changes include:
    a. Updated quantity of Lilly Turf (LI).
9. Drawing M-104 has been updated. Changes include:
    a. Ductwork layout revised.
10. Drawing P-003 has been updated. Changes include:
    a. Revised to show correct invert level.

Revisions to Volume 2:

1. Updated Prevailing Wage Schedule, dated 01/20/2025, is included.
2. Community Hiring Rider for Construction Contracts, dated February 20, 2025, is included.

Revisions to Volume 3:

1. Addendum to General Conditions:
    a. p.5: revisions to 013100 included
2. Table of Contents
    a. Added Specification Section 077236 to Division 7
    b. Added Signage Package to Appendix
3. Specifications:
    a. New Section 077236 “Smoke Vents” is included.
    b. Revisions to Specification section 096500 “Resilient Flooring.” Changes include:
        i. Luxury vinyl floor tile (LVT-1) product updated.
        ii. Luxury vinyl floor tile (LVT-2) product updated.
        iii. Vinyl composition floor tile (VCT-1) product added.
        iv. Stair landing material clarified.
    c. Revisions to Specification section 093000 “Tiling.” Changes include:
        i. Ceramic tile type (T1) product updated.
        ii. Ceramic tile type (T2) product updated.
    d. Revisions to Specification section 233300 “Air Duct Accessories.” Changes include:
        i. Exhaust Ventilator (Rain Cap) added.

Revisions to Appendix:

1. Signage Package, dated 02-20-2025, is included.

DDC PROJECT #: **LQASADA**

PROJECT NAME: **Astoria Branch Library Renovation**

ATTACHMENT C – REVISIONS TO PASSPORT FORMS

This Addendum initiates Round 3 of the procurement.

Please note that numbering of addenda is independent of rounds.

Questionnaire Changes:

None

Item Grid Changes:

None

Department of Design and Construction

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS

ADDENDUM TO THE GENERAL CONDITIONS
FOR SINGLE CONTRACT PROJECTS

The General Conditions are hereby amended in accordance with the terms and conditions set forth in this Addendum.

I. PROJECT DESCRIPTION

FMS #: LQASADA

PROJECT NAME: Astoria Branch Library Renovation

PROJECT DESCRIPTION: This Project consists of the gut renovation of the library interior. New construction includes the removal and replacement of the mezzanine floor structure and a new vestibule with elevator access to a new bridge to the mezzanine. The existing gas service will be removed and all new electrical, plumbing, heating/air-conditioning systems will be installed. There is new landscaping and entry access. Existing windows will be replaced.

PROJECT LOCATION: 14-01 Astoria Boulevard
BOROUGH: Queens
CITY OF NEW YORK
ZIP CODE: 11102
COMMUNITY BOARD #: Queens CB#1

LANDMARK STATUS:

DESIGNATED LANDMARK STRUCTURE OR SITE: ***NO***
If this is a Designated Landmark Structure or Site, Section 01 3591, Historic Treatment Procedures applies to this project.
LANDMARK QUALITY STRUCTURE: ***NO***
If this is a Landmark Quality Structure, Section 01 3591, Historic Treatment Procedures applies to this project.

II. LEED GREEN BUILDING REQUIREMENTS

This project must achieve a ***Silver*** LEED Green Building Rating. A certain number of credits are required for this rating and are detailed in the Addendum.

Sections 01 7419 Sub-Section 1.5(C) Waste Management Performance Requirements / LEED Certification, 01 8113.04 Sustainable Design Requirements for LEED v4 Buildings and 01 8119 Indoor Air Quality Requirements for LEED Buildings of the DDC Standard General Conditions apply to this project.

III. COMMISSIONING REQUIREMENTS

This project includes ***MEP and Building Enclosure*** Commissioning Requirements.

The General Commissioning Requirements for MEP Systems are found in Section 01 9113 of the DDC Standard General Conditions.

The General Commissioning Requirements for Building Enclosure are found in Section 01 9115 of the DDC Standard General Conditions.

Other specific Commissioning Requirements can be found in the Project Specification Sections.

IV. PROJECT MANAGEMENT

[X] DDC will publicly bid and enter into all contracts for the Project. DDC will manage the Project using its own personnel.

[ ] DDC will publicly bid and enter into all contracts for the Project. A Construction Management firm (the "CM") hired by DDC will manage the Project. The Contractor is advised that the CM will serve as the representative of the Commissioner at the site and will, subject to review by the Commissioner, be responsible for the inspection, management, coordination and administration of the required construction work, as delineated in the article of the Standard Construction Contract entitled "The Resident Engineer".

V. CONTRACTS FOR THE PROJECT

The Project consists of a single contract, the Contract for General Construction Work. The Contractor for General Construction Work is responsible for the performance of all required work for the Project as set forth in the Contract Documents (General Conditions, Drawings and Specifications), including all responsibilities and obligations assigned to separate Contractors for the following subdivisions of the work: Plumbing Work, HVAC Work, and Electrical Work. All responsibilities and obligations in the Contract Documents assigned to separate Contractors for such subdivisions of the work are the responsibility of the Contractor for General Construction Work.

VI. SCHEDULES

The Contractor is advised that Schedules A through E are attached to, and incorporated as part of, this Addendum to the General Conditions. These schedules contain important information that is specific to this Project. The Contractor is advised to carefully review these schedules.

VII. APPLICABILITY OF SECTIONS/SUB-SECTIONS AND AMENDED SUB-SECTIONS

The Contractor is advised that various Sections/Sub-Sections in the General Conditions may not apply to this Project or may apply as amended. Such Sections/Sub-Sections advise the Contractor to "Refer to the Addendum for the applicability of this Section/Sub-Section." Such Sections/Sub-Sections are set forth below. A check mark indicates whether the Section/Sub-Section (1) applies to the Project, (2) does not apply to the Project, or (3) applies to the Project as amended. If no box is checked, the Section/Sub-Section, as set forth in the General Conditions, applies to the Project. Amended Sections/Sub-Sections, if any, are set forth following this list of Sections.

Section	Sub-Section	Sub-Section	Applies		Does not Apply		Applies as Amended
01 1000	1.4 (B)	Scope and Intent / LEED	X				
	1.4(C)	Scope and Intent / Commissioning	X				
01 2100.10		Price Adjustment Allowance			X		
01 2100.20		Expanded Work Allowance	X				
01 2100.30		Project Work Acceleration Allowance			X		
01 3216.10		Project Schedules (Method A)			X		
01 3216.20		Project Schedules (Method B)	X				
01 3216.30		Project Schedules (Method C)			X		
	1.7 Q	Cost Loaded Schedule	X				
01 3233		Photographic Documentation	X				
01 3300	1.7 (A-D)	LEED Submittals	X				
01 3503		General Mechanical Requirements	X				
01 3506	3.2 (A-B)	Electrical Conduit System Including Boxes (Pull, Junction and Outlet)	X				
	3.3 (A-E)	Electrical Wiring Devices	X				
	3.4 (A-I)	Electrical Conductors and Terminations	X				
	3.5 (A-B)	Circuit Protective Devices	X				
	3.6 (A-J)	Distribution Centers	X				
	3.7 (A-I)	Motors	X				
	3.8 (A-I)	Motor Control Equipment	X				
01 3591		Historic Treatment Procedures			X		
01 5000	3.2 (A)	Temporary Water Facilities / Temporary Water			X		
	3.2 (B)	Temporary Water Facilities / Temporary Water – Work in Existing Facilities	X				
	3.3 (B)	Temporary Sanitary Facilities / Self-Contained Toilet Units			X		
	3.3 (C)	Temporary Sanitary Facilities / Existing Toilets	X				
	3.4 (B) 1	Temporary Power, Lighting, and Site Lighting / Connection to Utility Lines			X		
	3.4 (B) 2	Temporary Power, Lighting, and Site Lighting / Connection to Existing Electrical Power Service	X				
	3.4 (B) 3	Temporary Power, Lighting, and Site Lighting / Electrical Generator Power Service			X		
	3.4 (D)	Temporary Power, Lighting, and Site Lighting / Temporary Lighting	X				
	3.4 (E)	Temporary Power, Lighting, and Site Lighting / Site Security Lighting (for New Construction Only)			X		
	3.5 (A-J)	Temporary Heat	X				
	3.8 (A)	DDC Field Office / Office Space in Existing Building	X				

Section	Sub-Section	Sub-Section	Applies		Does not Apply		Applies as Amended
01 5000	3.8 (B), (B-3a)	DDC Field Office / DDC Managed Project Trailer			X		
	3.8 (B), (B-3b)	DDC Field Office / CM Managed Project Trailer			X		
	3.8 (D)	DDC Field Office / Additional Equipment for the DDC Field Office	X				
	3.13(A-D)	Work Fence Enclosure	X				
	3.14 (A-H)	Rodent and Insect Control	X				
	3.17(B)	Project Rendering	X				
	3.18 (A-D)	Security Guards / Fire Guards on Site	X				
01 5411	3.1 (A-J)	Temporary Use, Operation and Maintenance of Elevators During Construction for New Buildings Up To and Including 15 Stories	X				
	3.2 (A-M)	Temporary Use, Operation and Maintenance of Elevators During Construction for New Buildings Over 15 Stories			X		
	3.3 (A-E)	Temporary Use, Operation and Maintenance of Elevators During Construction for Existing Buildings			X		
01 5423	1.9 (A-C)	Sidewalk Sheds			X		
01 7300	3.3 (A-I)	Surveys	X				
	3.4 (A-B)	Borings			X		
	3.12 (A-D)	Sleeves and Hangers	X				
	3.13 (A)	Sleeve and Penetration Drawings	X				
	3.15 (A)	Location of Partitions	X				
01 7419	1.5 (C)	Waste Management Performance Requirements / LEED Certification	X				
01 7900		Demonstration and Owner's Pre-Acceptance Orientation	X				
01 8113.03		Sustainable Design Requirements for LEED v3 Buildings			X		
01 8113.04		Sustainable Design Requirements for LEED v4 Buildings	X				
01 81 13.10		Environmentally Preferable Purchasing (EPP) Compliance			X		
01 8113.13		VOC Limits for Adhesives, Sealants, Paints and Coatings for LEED v3 Buildings			X		
01 8119		Indoor Air Quality Requirements for LEED Buildings	X				
01 9113		General Commissioning Requirements for MEP Systems	X				
01 9115		General Commissioning Requirements for Building Enclosure	X				

AMENDED SECTIONS/SUB-SECTIONS

The Contractor is advised that the amended Sub-Sections set forth below are included in the General Conditions and apply to the Project.

Revise Section 01 10 00 as noted below:

1.13 INDEMNIFICATION AGREEMENT

A. The Contractor is required to enter into a separate indemnification agreement with the Queens Public Library based on the language in the sample in the Project's Appendix, included in the PASSPort RFx.

Revise Section 01 31 00 as noted below:

1.10 FACILITY TO BE CLOSED

A. The library will remain closed for the duration of construction.

B. Contractor must assume responsibility of the entire building site, including snow and litter removals.

C. During demolition, Contractor will be responsible for removing all items considered obsolete by DDC and the Queens Public Library, including furniture, shelving, equipment, tools, etc.

Revise Section 01 5000 as noted below:

3.18 SECURITY GUARDS/ FIRE GUARDS ON SITE

A.7. The Contractor is required to provide full time security guard(s) in compliance with this section.

A.8. In addition to the requirements set forth herein, any day that the Contractor and/or its subcontractors do not work on the site during the day, a security guard must be provided during the hours of 8:00 A.M. to 4:00 P.M.

VIII. SPECIAL EXPERIENCE REQUIREMENTS FOR THE PROJECT

Refer to the PASSPort Questionnaire for Special Experience Requirements.

IX. REVISIONS: SPECIFICATIONS AND CONTRACT DRAWINGS

The Specifications and the Contract Drawings for the Project are revised in accordance with the provisions set forth below.

(1) Owner: Wherever the term "Owner" is used in the Specifications and/or the Contract Drawings, such term means the City of New York.

(2) Other Entities: In the event any entity other than the City of New York is referred to or named as the "Owner" in the Specifications and/or the Contract Drawings, the name of such other entity is deemed deleted and replaced with the "City of New York".

(3) Architect / Engineer: Wherever the words "Architect", "Engineer", "Architect / Engineer" or "Architect and/or Engineer" are used in the Specifications and/or the Contract Drawings, such words are deemed deleted and replaced with the word "Commissioner".

(4) Products / Manufacturers: Wherever the Specifications and/or the Contract Drawings require the Contractor to provide a particular product (i.e., material and/or equipment) from a designated manufacturer and/or vendor, the term "or approved equal" is deemed inserted, even if only one product and/or manufacturer is specified, except as otherwise provided below.
   (a) Proprietary Items: If the Documents section in PASSPort contains a Notice which identifies a particular product from a designated manufacturer as a "Sole Source Product, the Contractor is required to provide such specified product. In such case, no substitution or "approved equal" will be permitted.

(5) Special Experience Requirements: Special Experience Requirements for the Project, if any, are set forth in the PASSPort Questionnaire. Special Experience Requirements may apply to Contractors, subcontractors, installers, fabricators, applicators, erectors, specialists, manufacturers and/or suppliers. Refer to DDC General Conditions Section 014000 Article 1.7.C for applicable Special Experience qualification levels. If the Specifications and/or the Contract Drawings contain any Special Experience Requirement that is not set forth in the PASSPort Questionnaire, such Special Experience Requirement is deemed deleted, except as otherwise provided below.
   (a) Any Special Experience Requirement that provides that the entity performing the work or supplying the material must have more than three (3) years of experience, is revised to provide that the entity performing the work or supplying the material must have three (3) years of experience as noted in DDC General Conditions Section 014000 Quality Requirements, Article 1.7.B, except as described in paragraph (b) below.
   (b) Any Special Experience Requirement that pertains to the abatement of hazardous materials is not be subject to the deletion and/or revision set forth above. Such Special Experience Requirement remains in full force and effect.
   (c) Except as set forth in the DDC General Conditions Article 1.7, any Special Experience Requirement that provides that the individual workers performing the work must be licensed, authorized, certified, approved by or acceptable to the manufacturer, is deemed deleted and replaced with the requirement that such individual workers must be properly trained for the specified work.

(6) Alternate Bids: If the agency is requesting the submission of Alternate Bids, a Notice regarding such Alternate Bids is set forth in the Documents section in PASSPort. In the event of any conflict or inconsistency between (1) the Notice regarding Alternate Bids set forth in the Documents section in PASSPort and (2) a provision in the Specifications and/or the Contract Drawings regarding Alternate Bids, the Notice set forth in the Documents section in PASSPort will prevail. If the agency is not requesting the submission of Alternate Bids, as indicated by the absence of a Notice in the Documents section in PASSPort, and the Specifications and/or the Contract Drawings contain any provision regarding Alternate Bids, such provision is deemed deleted.

(7) Contractor Retained Engineer: If the Specifications and/or the Contract Drawings require the Contractor to retain an Engineer to provide engineering services for the Project, the following sentence is deemed inserted: "Such Engineer must be a Professional Engineer, licensed in the State of New York."

(8) LEED Related Provisions: If the Specifications and/or the Contract Drawings require the Contractor to purchase FSC certified wood, rapidly renewable materials, or materials within 500 miles (LEED v3) or 100 miles (LEED v4), such provisions are deemed deleted and replaced with the requirement that if the Contractor has purchased

FSC certified wood, rapidly renewable materials, or materials within 500 miles (LEED v3) or 100 miles (LEED v4), the Contractor must submit such forms or documentation as may be required by the City in order for the USGBC to certify that the Project qualifies for the related LEED credit(s).

(9) Guarantees: Requirements for Guarantees and Maintenance are set forth in Schedule B, which is included in the Addendum to the General Conditions. In the event of any conflict or inconsistency between (1) a guarantee and/or maintenance requirement set forth in the Specifications and/or the Contract Drawings and (2) a guarantee and/or maintenance requirement set forth in Schedule B, the guarantee and/or maintenance requirement set forth in Schedule B will prevail.

(10) Warranties: Requirements for Warranties are set forth in Schedule B, which is included in the Addendum to the General Conditions.

(a) The term "manufacturer's warranty" as described in this article encompasses the following terms as indicated in the Specifications: "Manufacturer's Warranty", "Manufacturer's Special Warranty", "Special Warranty", "Special Finish Warranty", "Manufacturer's Special Warranty for a (product, assembly)."

(b) In the event of any conflict or inconsistency between (1) a warranty requirement set forth in the Specifications and/or the Contract Drawings and (2) a warranty requirement set forth in Schedule B, the warranty requirement set forth in Schedule B will prevail.

(c) In the event a warranty requirement set forth in the Specifications and/or the Contract Drawings is omitted from Schedule B, such omission from Schedule B has no effect and the Contractor's obligation to provide the manufacturer's warranty, as set forth in the Specifications and/or the Contract Drawings, will remain in full force and effect.

(d) In the event a warranty requirement for a particular item of material or equipment is omitted from Schedule B, as well as from the Specifications or the Contract Drawings, and the manufacturer of such item actually provides a warranty, the Contractor is obligated to obtain and deliver to the Commissioner the highest level of warranty actually provided by that manufacturer.

(11) Exculpatory Provisions: In the event the Specifications and/or the Contract Drawings contain any provision whereby the consultant and/or any of its officers, employees or agents, including subconsultants, is absolved of responsibility for any act or omission, such provision is deemed deleted.

(12) Insurance: Provisions regarding insurance coverage the Contractor is required to provide are set forth in Article 22 of the City of New York Standard Construction Contract and Schedule A, which is included in the Addendum to the General Conditions. In the event the Specifications and/or the Contract Drawings contain any provision regarding insurance requirements, such provision is deemed deleted.

(13) Indemnification: Provisions regarding indemnification are set forth in Articles 7, 12, 22 and 57 of the City of New York Standard Construction Contract and, if applicable, in the Indemnification Agreement in the Appendix. In the event the Specifications and/or the Contract Drawings contain any provision regarding indemnification, such provision is deemed deleted.

(14) Dispute Resolution: Provisions regarding dispute resolution are set forth in Article 27 of the City of New York Standard Construction Contract. In the event the Specifications and/or the Contract Drawings contain any provision regarding dispute resolution, such provision is deemed deleted.

(15) Payment to Other Entities: In the event the Specifications and/or the Contract Drawings contain any provision which requires the Contractor to make payments to an entity other than a subcontractor and/or supplier providing services and/or material for the project, such provision is deemed deleted.

(16) General Conditions: In the event of any conflict or inconsistency between (1) the Specifications and/or the Contract Drawings and (2) the General Conditions, the General Conditions will prevail.

(17) Standard Construction Contract: In the event of any conflict or inconsistency between (1) the Specifications and/or the Contract Drawings and (2) the City of New York Standard Construction Contract, the City of New York Standard Construction Contract will prevail.

(18) Shall: Wherever the word "shall" is used in the Specifications and/or the Contract Drawings with respect to the Contractor's or Subcontractor's responsibilities or Project Requirements, the term is intended to convey a contractual mandate, such as the terms "must," "will," or "be obliged to" (and not "may").

SCHEDULE A (FOR PUBLICLY BID PROJECTS)
PART I – Contract Requirements

Various Articles of the Contract refer to requirements which are set forth in Schedule A of the General Conditions. The Schedule set forth below specifies the following: (1) the referenced Articles of the Contract, and (2) the specific requirements applicable to the contract.

REFERENCE	ITEM	REQUIREMENTS	CONTRACT #1
Information For Bidders	Bid Security	The Contractor must obtain a bid security in the amount indicated to the right.	Required provided the TOTAL BID PRICE set forth on the Bid Form is $1,000,000. Or more. Certified Check: 2% of Bid Amount or Bond: 10% of Bid Amount
Information For Bidders	Performance and Payment Bonds		For Contracts in the amount of $1,000,000.00 or more, Performance and Payment Bonds must each be in amount equal to 100% of the Contract Price.
Information For Bidders	Department of Design and Construction Safety Requirements	The Contractor must provide the safety personnel as indicated to the right	■ Project Safety Representative □ Dedicated, full-time Project Safety Representative
Article 14 Contract	Time of Substantial Completion	Consecutive Calendar Days	**730 CCDs**
Article 15 Contract	Liquidated Damages	For each consecutive calendar day over completion time	**$600**
Article 17 Contract	Sub-Contracts	Not to exceed Percent of Contract Price	**60%**
Article 21 Contract	Retainage	Percent of Voucher	If 100% bonds are required **5%** If 100% bonds are not required, and Contract Price is $1,000,000 or less **5%** If 100% bonds are not required, and Contract Price is more than $1,000,000 **10%**
Article 24 Contract	Deposit Guarantee	Percent of Contract Price	**1%**
Article 24 Contract	Period of Guarantee		See Schedule B of the Addendum to the General Conditions
Article 75 Contract	Compensation to be Paid to Contractor		Amount for which the Contract was Awarded: _____ _____ Dollars ($_____)
Article 79 Contract	MWBE Program		See M/WBE Utilization Plan in the PASSPort Procurement M/WBE Considerations Section.

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 – Insurance

PART II. Types of Insurance, Minimum Limits and Special Conditions

Note: All certificate(s) of insurance submitted pursuant to Contract Article 22.3. 3 must be accompanied by a Certification by Broker consistent with Part III below and include the following information:

- **For each insurance policy, the name and NAIC number of issuing company, number of policy, and effective dates;**
- **Policy limits consistent with the requirements listed below;**
- **Additional insureds or loss payees consistent with the requirements listed below; and**
- **The number assigned to the Contract by the City (in the "Description of Operations" field).**

Insurance indicated by a blackened box (■) or by (X) in the ☐ to left will be required under this contract.

Types of Insurance (per Article 22 in its entirety, including listed paragraph)	Minimum Limits and Special Conditions
■ Commercial General Liability Art. 22.1.1	This Contract requires Commercial General Liability Insurance (CGL) that is at least as broad as ISO Form CG 00 01 (see Section 22.1.1 of the New York City Standard Construction Contract). The minimum limits shall be $1,000,000.00 per occurrence and $2,000,000.00 per project aggregate applicable to this Contract unless the Work requires a permit from the Department of Buildings and greater limits of Commercial General Liability Insurances are required pursuant to 1 RCNY section 101-08. Additional Insureds: 1. City of New York, including its officials and employees, with coverage at least as broad as ISO Forms CG 20 10 and CG 20 37, and 2. All person(s) or organization(s), if any, that Article 22.1.1(b) of the **Contract** requires to be named as Additional Insured(s), with coverage at least as broad as ISO Form CG 20 26. The Additional Insured endorsement shall either specify the entity's name, if known, or the entity's title (e.g., Project Manager). 3. The Queens Borough Public Library and the Library Board of Trustees

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART II. Types of Insurance, Minimum Limits and Special Conditions

Insurance indicated by a blackened box (■) or by (X) in the ☐ to left will be required under this contract.

Types of Insurance (per Article 22 in its entirety, including listed paragraph)	Minimum Limits and Special Conditions
■ Workers' Compensation Art. 22.1.2 ■ Disability Benefits Insurance Art. 22.1.2 ■ Employers' Liability Art. 22.1.2 □ Jones Act Art. 22.1.3 □ U.S. Longshoremen's and Harbor Workers Compensation Act Art. 22.1.3	Workers' Compensation, Employers' Liability, and Disability Benefits Insurance: Statutory per New York State law without regard to jurisdiction. **Note**: The following forms are acceptable: (1) New York State Workers' Compensation Board Form No. C-105.2, (2) State Insurance Fund Form No. U-26.3, (3) New York State Workers' Compensation Board Form No. DB-120.1 and (3) Request for WC/DB Exemption Form No. CE-200. The City will not accept an ACORD form as proof of Workers' Compensation or Disability Insurance. Jones Act and U.S. Longshoremen's and Harbor Workers' Compensation Act: Statutory per U.S. law.
■ Builders' Risk Art. 22.1.4	100 % of total value of **Work** **Contractor** the Named Insured; the **City** both an Additional Insured and one of the loss payees as its interests may appear. Installation Floater is not permitted. Note: Builders Risk Insurance may terminate upon **Substantial Completion** of the **Work** in its entirety.
■ Commercial Auto Liability Art. 22.1.5	$1,000,000.00 per accident combined single limit If vehicles are used for transporting hazardous materials, the **Contractor** shall provide pollution liability broadened coverage for covered vehicles (endorsement CA 99 48) as well as proof of MCS 90

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART II. Types of Insurance, Minimum Limits and Special Conditions

Insurance indicated by a blackened box (■) or by (X) in the ☐ to left will be required under this contract.

Types of Insurance (per Article 22 in its entirety, including listed paragraph)	Minimum Limits and Special Conditions
□ Contractor's Pollution Liability Art. 22.1.6	$_____ per occurrence $_____ aggregate Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
□ Marine Protection and Indemnity Art. 22.1.7(a)	$_____ per occurrence $_____ aggregate Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
□ Hull and Machinery Insurance Art. 22.1.7(b)	$_____ per occurrence $_____ aggregate Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
□ Marine Pollution Liability Art. 22.1.7(c)	$_____ each occurrence Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
[OTHER] Art. 22.1.8 □ Ship Repairers Legal Liability	$_____ each occurrence

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART II. Types of Insurance, Minimum Limits and Special Conditions (Continued)

Insurance indicated by a blackened box (■) or by (X) in the ☐ to left will be required under this contract.

Types of Insurance (per Article 22 in its entirety, including listed paragraph)	Minimum Limits and Special Conditions
[OTHER] Art. 22.1.8 □ Collision Liability/Towers Liability	$_____ per occurrence $_____ aggregate Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
[OTHER] Art. 22.1.8 □ Railroad Protective Liability _____	$_____ per occurrence $_____ aggregate Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____
[OTHER] Art. 22.1.8 ■ Asbestos Liability _____	Only required of the Contractor or Subcontractor performing any required asbestos removal. $1,000,000 each occurrence, $2,000,000 aggregate (Combined Single Limit); only required of the Contractor or Subcontractor performing any required asbestos removal. Additional Insureds: 1. City of New York, including its officials and employees, and 2. The Queens Borough Public Library and the Library Board of Trustees

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART II. Types of Insurance, Minimum Limits and Special Conditions (Continued)

Insurance indicated by a blackened box (■) or by (X) in the ☐ to left will be required under this contract.

[OTHER] Art. 22.1.8 □ Boiler Insurance_____	$200,000
[OTHER] Art. 22.1.8 ■ Professional Liability In the event any section of the Specifications requires the Contractor to engage a Professional Engineer to provide design and/or engineering services, the Engineer engaged by the Contractor, as well as any sub consultant(s) performing professional services, shall provide Professional Liability Insurance.	$1,000,000 per occurrence The Contractor's Professional Engineer shall maintain and submit evidence of Professional Liability Insurance in the minimum amount of $1,000,000 per claim. The policy or policies shall include an endorsement to cover the liability assumed by the Contractor under this Agreement arising out of the negligent performance of professional services or caused by an error, omission or negligent act of the Contractor's Professional Engineer or anyone employed by the Contractor's Professional Engineer. Claims-made policies will be accepted for Professional Liability Insurance. All such policies shall have an extended reporting period option or automatic coverage of not less than two (2) years. If available as an option, the Contractor's Professional Engineer shall purchase extended reporting period coverage effective on cancellation or termination of such insurance unless a new policy is secured with a retroactive date, including at least the last policy year.
OTHER] Art. 22.1.8 □ Umbrella/Excess Liability Insurance The Contractor shall provide Umbrella/Excess Liability Insurance in the minimum amounts shown to the right. The policy terms and condition should be at least as broad as the underlying policies. The underlying policies should comply with the insurance provision as outlined by the contract. Defense cost should be in addition to the limit of liability. The City of New York, including its officials and employees, should be included as additional insured as respects to the noted project.	$10,000,000 per Occurrence and $10,000,000 in Aggregate

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART III. Certificates of Insurance

All certificates of insurance (except certificates of insurance solely evidencing Workers' Compensation Insurance, Employer's Liability Insurance, and/or Disability Benefits Insurance) must be accompanied by one of the following:

(1) the Certification by Insurance Broker or Agent on the following page setting forth the required information and signatures;

-- OR --

(2) copies of all policies as certified by an authorized representative of the issuing insurance carrier that are referenced in such certificate of insurance. If any policy is not available at the time of submission, certified binders may be submitted until such time as the policy is available, at which time a certified copy of the policy shall be submitted.

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART III. Certification by Insurance Broker or Agent

The undersigned insurance broker or agent represents to the City of New York that the attached Certificate of Insurance is accurate in all material respects.

_____
[Name of broker or agent (typewritten)]

_____
[Address of broker or agent (typewritten)]

_____
[Email address of broker or agent (typewritten)]

_____
[Phone number/Fax number of broker or agent (typewritten)]

_____
[Signature of authorized official or broker or agent]

_____
[Name and title of authorized official, broker or agent (typewritten)]

State of ……...)
) ss:
County of ……)

Sworn to before me this

_____ day of _____, 20__

_____
NOTARY PUBLIC FOR THE STATE OF_____

SCHEDULE A (FOR PUBLICLY BID PROJECTS)

Relating to Article 22 - Insurance

PART IV. Address of Commissioner

Wherever reference is made in Article 7 or Article 22 to documents to be sent to the **Commissioner** (e.g., notices, filings, or submissions), such documents must be sent via email to insurance@ddc.nyc.gov. Hard copies of such documents will no longer be required or accepted.

SCHEDULE B

Guarantees and Warranties

(Reference: Section 01 7839, Article 2.7 of the DDC Standard General Conditions)

GUARANTY FROM CONTRACTOR

(1) Contractor's Guaranty Obligation: The Contractor must promptly repair, replace, restore or rebuild, as the Commissioner may determine, any finished Work in which defects of materials or workmanship may appear or to which damage may occur because of such defects, during the one (1) year period subsequent to the date of Substantial Completion (or use and occupancy in accordance with the Contract), except for the areas of Work set forth below:

- Roofing, Waterproofing, and Joint Sealant Work. For these types of work, the guarantee period will be (2) two years.

- Trees and/or Plant Material. For trees and/or plant material furnished and installed, the guarantee period will be (2) two years. During the guarantee period, the Contractor must provide all maintenance services set forth in the Specifications.

(2) Guaranty Period: The obligation of the Contractor, and its Surety under the Performance Bond, is limited to the period(s) of time specified above.

(3) Other Provisions Deemed Deleted: In the event the Specifications and/or the Contract Drawings contain any provisions regarding guaranty requirements, such provisions are deemed deleted and replaced with the guaranty requirements set forth in this Schedule B.

****

WARRANTY FROM MANUFACTURER

(1) Contractor's Obligation to Provide Warranties: The items of material and/or equipment for which manufacturer warranties are required are listed below. For each item of material and/or equipment listed below, the Contractor must obtain a written warranty from the manufacturer. Such warranty must provide that the material or equipment is free from defects for the period set forth below and will be replaced or repaired within such specified period. The Contractor must deliver all required warranties to the Commissioner.

(2) Required Warranties:

Specification Number	Material or Equipment	Warranty Period
03 15 00	Concrete Accessories	2 years
05 73 13	Laminated Glass	10 years
07 13 26	Self Adhering Sheet waterproofing	5 years
07 31 26	Slate shingles	20 years
07 42 13.13	Formed metal panels	20 years
	Formed metal panels finish	20 years
07 42 13.16	Metal plate wall panels	20 years
	Metal plate wall panels finish	20 years
07 52 16	SBS modified membrane roofing	20 years
07 81 00	Applied fireproofing	5 years
07 92 00	Joint Sealants	5 years
08 41 13	Aluminum framed system	10 years
	Aluminum Finish	20 years
08 44 13	Aluminum curtain wall system	10 years
	Aluminum Finish	20 years

Specification Number	Material or Equipment	Warranty Period
08 51 13	Aluminum Windows	10 years
	Glazing Units	10 years
	Aluminum Finish	20 years
08 71 00	Door Hardware	5 years
08 80 00	Coated-Glass Products	10 years
	Laminated Glass	10 Years
	Insulated Glass	10 years
08 81 26	Aluminum Framed System	10 years
08 83 00	Mirrors	5 years
08 91 19	Component Finish	20 years
09 68 13	Tile Carpeting	10 years
10 11 00	Visual Display Units	2 years
10 14 00	Signage	3 years
10 22 39	Folding Panel Partitions	2 years
10 28 13	Mirrors	15 years
11 51 00	RFID gates	5 years
11 51 00	Automated Material Handling System	5 years
14 24 00	Hydraulic Elevator	1 year
22 05 23	General Duty Valves	1 year
22 05 29	Hangers and Supports for Plumbing Piping	1 year
22 05 53	Identification for Plumbing Piping & Equipment	1 year
22 07 00	Plumbing Insulation	1 year
22 11 13	Facility Water Distribution Piping	1 year
22 11 16	Domestic Water Piping	1 year
22 11 19	Domestic Water Piping Specialties	1 year
22 13 16	Sanitary Waste and Vent Piping	1 year
22 13 19	Sanitary Waste Piping Specialties	1 year
22 14 13	Storm Water Drainage Piping	1 year
22 14 23	Storm Drainage Piping Specialties	1 year
22 14 29	Sump Pumps	1 year
22 33 00	Electric Domestic Hot Water Heater	1 year
	Pressure vessel - Non Prorated	5 years
22 40 00	Plumbing Fixtures	1 year
23 05 13	Common Motor Requirements for HVAC	1 year
23 05 29	Hangers & Supports for HVAC Piping & Equipment	1 year
23 05 48.13	Vibration Controls for HVAC	1 year
23 05 53	Identification for HVAC Piping and Equipment	1 year
23 07 00	HVAC Insulation	1 year
23 23 00	Refrigerant Piping	1 year
23 31 13	Metal Ducts	1 year
23 33 00	Air Duct Accessories	1 year
23 34 16	Centrifugal HVAC Fans	1 year
23 37 13	Material and Workmanship	1 year
23 63 13	Air-Cooled Refrigerant Condenser	1 year
23 74 33	Dedicated Outdoor-Air Units	1 year
	Compressor(s)	5 years
23 81 29	Parts and Compressor(s)	7 years
23 82 16.14	Electric-Resistance Air Coils	1 year
23 82 39.19	Wall & Ceiling Unit Heaters	1 year
26 05 19	Low Voltage Elec. Power Conductors & Cables	1 year
26 05 26	Grounding and Bonding for Electrical Systems	1 year
26 05 53	Identification for Electrical Systems	1 year
26 09 23	Lighting Control Devices	5 years
26 24 16	Panelboards	1 year

Specification Number	Material or Equipment	Warranty Period
26 28 13	Fuses	1 year
26 28 16.13	Enclosed Circuit Breakers	1 year
26 28 16.16	Enclosed Switches	1 year
26 29 13	Enclosed Controllers	1 year
26 33 23	Central Battery Equipment	2 years
	Central Battery	1 year 14 years prorated
26 43 13	Surge protective Devices for Low-Voltage Power Circuits	10 years
27 10 00	Structured Cabling	2 years
27 41 00	Audio-Video Systems	1 year
28 00 00	Security Systems Parts & Labor	1 year
28 46 20	Fire Alarm	1 year
32 31 13	Chain Link Fences & Gates	5 years

(3) Application: The obligations under the warranty for the periods specified above apply only to the manufacturer of the material or equipment, and not to the Contractor or its Surety; provided, however, the Contractor retains responsibility for obtaining all required warranties from the manufacturers and delivering the same to the Commissioner.

(4) Other Provisions: The warranty requirements set forth in this Schedule B are also included in the Specifications.

(a) In the event of any conflict between a warranty requirement set forth in the Specifications and a warranty requirement set forth in Schedule B, the warranty requirement set forth in Schedule B will take precedence.

(b) In the event a warranty requirement set forth in the Specifications is omitted from Schedule B, such omission from Schedule B will have no effect and the Contractor's obligation to provide the manufacturer's warranty, as set forth in the Specifications, will remain in full force and effect.

(c) In the event a warranty requirement for a particular item of material or equipment is omitted from both Schedule B and the Specifications, and the manufacturer of such item actually provides a warranty, the Contractor is obligated to obtain and deliver to the Commissioner the highest level of warranty actually provided by that manufacturer.

(d) In the event a warranty requirement is provided for a particular item of material or equipment, and such requirement specifies a warranty period that is longer than that which is actually provided by any of the specified manufacturers, the Contractor is obligated to obtain and deliver to the Commissioner the highest level of warranty actually provided by any of the specified manufacturers, unless otherwise directed in writing by the Commissioner.

(e) Unless indicated otherwise, Warranties are to take effect on the date of Substantial Completion.

SCHEDULE C

Contract Drawings

(Reference: Section 01 1000, Article 1.5 (A) of the DDC Standard General Conditions)

The Schedule set forth below lists all Contract Drawings for the Project.

	ARCHITECTURAL
T-001.00	COVER SHEET
T-002.00	EXITING DIAGRAM
G-001.00	SURVEY
Z-100.00	ZONING CALCULATION
A-000.00	SITE PLAN
A-001.00	ADA STANDARDS SYMBOLS & NOTES
A-002.00	FIRM MAP
DM-100.00	DEMOLITION PLANS
DM-101.00	DEMOLITION RCPS
DM-200.00	DEMOLITION ELEVATIONS
A-100.00	PROPOSED BASEMENT PLAN
A-101.00	PROPOSED FIRST FLOOR PLAN
A-102.00	PROPOSED MEZZANINE PLAN
A-103.00	PROPOSED ATTIC PLAN
A-104.00	PROPOSED ROOF PLAN
A-110.00	PROPOSED BASEMENT REFLECTED CEILING PLAN
A-111.00	PROPOSED FIRST FLOOR REFLECTED CEILING PLAN
A-112.00	PROPOSED MEZZANINE REFLECTED CEILING PLAN
A-200.00	PROPOSED SECTIONS
A-400.00	PROPOSED EXTERIOR ELEVATIONS
A-410.00	PROPOSED ELEVATIONS OF ADDITION
A-411.00	PROPOSED PLANS OF ADDITION
A-500.00	TOILET ELEVATIONS
A-501.00	CHILDREN'S AREA & STAFF ROOM ELEVATIONS
A-502.00	MULTIPURPOSE ROOM ELEVATIONS
A-503.00	TEEN AREA & WORKROOM ELEVATIONS
A-504.00	ADULT AREA ELEVATIONS
A-505.00	YALP CLASSROOM & STAIR A ELEVATIONS
A-506.00	ELEVATOR ELEVATIONS AND DETAILS
A-507.00	ATTIC DETAILS
A-508.00	FLOOR PATTERN
A-550.00	CEILING DETAILS
A-551.00	BRIDGE SECTION DETAIL
A-552.00	INTERIOR GLAZING DETAIL
A-560.00	INTERIOR GENERAL DETAILS
A-561.00	MOVABLE PARTITION DETAILS
A-562.00	HANDRAIL DETAILS STAIR B
A-600.00	PROPOSED WALL SECTIONS @ EXISTING

A-601.00	PROPOSED CROSS SECTIONS @ ADDITION
A-602.00	PROPOSED LONGITUDINAL WALL SECTIONS @ ADDITION
A-603.00	ELEVATOR SHAFT SECTIONS
A-650.00	CURTAIN WALL DETAIL-1 @ ENTRANCE DOOR
A-651.00	CURTAIN WALL DETAIL-2 @ SOUTH ELEVATION
A-652.00	CURTAIN WALL PLAN DETAILS
A-653.00	CURTAIN WALL SECTION DETAILS 1
A-654.00	CURTAIN WALL SECTION DETAILS 2
A-660.00	EXTERIOR REPLACEMENT WINDOW DETAILS
A-670.00	EXTERIOR DETAILS 1
A-671.00	EXTERIOR DETAILS 2
A-672.00	ROOFING DETAILS
A-673.00	CRICKET DETAILS
A-900.00	WINDOW SCHEDULE
A-901.00	PARTITION & FINISH SCHEDULES
A-902.00	DOOR SCHEDULES & DETAILS
A-903.00	MILLWORK
A-904.00	MILLWORK LIBRARIAN'S DESKS
	FURNITURE
F-101.00	BASEMENT FURNITURE PLAN (NIC-INFORMATION ONLY)
F-102.00	FIRST FLOOR FURNITURE PLAN (NIC-INFORMATION ONLY)
F-103.00	MEZZANINE FURNITURE PLAN (NIC- INFORMATION ONLY)
	LANDSCAPE
L-000.00	GENERAL NOTES, ABBREVIATIONS AND SYMBOLS
L-100.00	LANDSCAPE DEMOLITION PLAN
L-200.00	SITE LAYOUT PLAN
L-300.00	GRADING PLAN
L-400.00	LIGHTING PLAN
L-500.00	PLANTING PLAN AND SCHEDULE
L-501.00	PLANTING PLAN
L-502.00	PLANTING DETAIL
L-600.00	ELEVATION & DETAILS
L-601.00	DETAILS
L-602.00	DETAILS
	STRUCTURAL
FO-001.00	GENERAL NOTES
FO-002.00	PLOT PLAN & SCOPE OF WORK
FO-100.00	BASEMENT FLOOR PLAN
FO-300.00	FOUNDATION DETAILS 1
FO-301.00	FOUNDATION DETAILS 2
FO-302.00	FOUNDATION DETAILS 3
FO-303.00	ISOMETRIC VIEW OF BASEMENT WALLS
S-001.00	GENERAL NOTES
S-002.00	PLOT PLAN & SCOPE OF WORK

S-101.00	1ST FLOOR PLAN
S-102.00	MEZZANINE FLOOR PLAN
S-103.00	ROOF PLAN
S-104.00	ATTIC PLAN
S-200.00	SECTION
S-201.00	SECTIONS OF HORIZONTAL ENLARGEMENT
S-400.00	STEEL JOINT DETAILS 1
S-401.00	STEEL JOINT DETAILS 2
S-402.00	LINTEL DETAILS
S-403.00	STEEL JOINT DETAILS 3
S-404.00	STEEL JOINT DETAILS 4
S-405.00	STEEL JOINT DETAILS 5
S-500.00	FAÇADE STEEL DETAILS
S-501.00	BRIDGE GLASS RAIL DETAILS
S-502.00	MISCELLANEOUS DETAILS
S-600.00	COLUMN AND SLAB SCHEDULE
	MECHANICAL
M-001.00	MECHANICAL NOTES, SYMBOLS, LEGENDS & ABBREVIATIONS
DM-101.00	MECHANICAL BASEMENT DEMOLITION PLAN
DM-102.00	MECHANICAL 1ST FLOOR DEMOLITION PLAN
DM-103.00	MECHANICAL MEZZANINE & ATTIC DEMOLITION PART PLANS
M-101.00	MECHANICAL BASEMENT PLAN
M-102.00	MECHANICAL 1ST FLOOR PLAN
M-103.00	MECHANICAL MEZZANINE PLAN
M-104.00	MECHANICAL ATTIC PLAN
M-105.00	MECHANICAL ROOF PLAN
M-106.00	MECHANICAL SECTIONS
M-201.00	MECHANICAL BASEMENT PIPING PLAN
M-202.00	MECHANICAL 1ST FLOOR PIPING PLAN
M-203.00	MECHANICAL ATTIC PIPING PLAN
M-301.00	MECHANICAL RISER DIAGRAMS
M-401.00	MECHANICAL SCHEDULES
M-402.00	MECHANICAL SCHEDULES & DIAGRAMS
M-501.00	MECHANICAL DETAILS
M-502.00	MECHANICAL DETAILS
M-503.00	MECHANICAL DETAILS
M-601.00	MECHANICAL CONTROL DIAGRAMS & DETAILS
M-602.00	MECHANICAL CONTROL DIAGRAMS
	PLUMBING
P-001.00	PLUMBING LEGEND, NOTES, DRAWING LIST AND PLOT PLAN
P-002.00	PLUMBING SCHEDULES
P-003.00	PLUMBING SITE PLAN
P-101.00	BASEMENT DEMOLITION PLUMBING PLAN
P-102.00	1ST FLOOR DEMOLITION PLUMBING PLAN

P-103.00	BASEMENT UNDERGROUND PLUMBING PLAN
P-104.00	BASEMENT PLUMBING PLAN
P-105.00	1ST FLOOR PLUMBING PLAN
P-106.00	MEZZANINE PLUMBING PLAN
P-107.00	ROOF PLUMBING PLAN
P-201.00	SANITARY AND STORM WATER RISER DIAGRAMS
P-202.00	DOM, WATER RISER, DIAGRAM
P-301.00	PLUMBING DETAILS
P-302.00	PLUMBING DETAILS
P-303.00	BACKFLOW PREVENTER INSTALLATION DETAILS
	ELECTRICAL
E-001.00	ELECTRICAL SYMBOLS AND GENERAL NOTES
DE-101.00	ELECTRICAL DEMOLITION PLAN
E-101.00	BASEMENT ELECTRICAL PLAN
E-102.00	1ST FLOOR ELECTRICAL PLAN
E-103.00	MEZZANINE ELECTRICAL PLAN
E-104.00	ATTIC ELECTRICAL PLAN & ROOF PART PLAN
E-201.00	BASEMENT REFLECTED CEILING PLAN
E-202.00	1ST FLOOR REFLECTED CEILING PLAN
E-203.00	MEZZANINE REFLECTED CEILING PLAN
E-204.00	ATTIC REFLECTED CEILING PLAN
E-205.00	LIGHTING CONTROL DIAGRAM
E-206.00	LIGHTING FIXTURE SCHEDULE
E-207.00	LIGHTING FIXTURE SCHEDULE
E-301.00	ELECTRICAL RISER DIAGRAM, DETAILS & PANEL SCHEDULES
E-401.00	ELECTRICAL PANEL SCHEDULES
E-402.00	ELECTRICAL SCHEDULES
E-501.00	ELECTRICAL DETAILS
	FIRE ALARM
FA-001.00	FIRE ALARM NOTES AND SYMBOL LIST
FA-002.00	FIRE ALARM NOTES DETAILS
DFA-101.00	FIRE ALARM BASEMENT DEMOLITION PLAN
DFA-102.00	FIRE ALARM 1ST FLOOR DEMOLITION PLAN
DFA-103.00	FIRE ALARM MEZZANINE DEMOLITION PLAN
FA-101.00	BASEMENT FIRE ALARM PLAN
FA-102.00	1ST FLOOR FIRE ALARM PLAN
FA-103.00	MEZZANINE FIRE ALARM PLAN
FA-104.00	ATTIC FIRE ALARM PLAN
FA-301.00	FIRE ALARM RISER DIAGRAM & DETAILS
	ENERGY COMPLIANCE
EN-001.00	ENERGY COMPLIANCE SHEET
EN-002.00	ENERGY COMPLIANCE SHEET
EN-003.00	ENERGY COMPLIANCE SHEET
EN-100.00	ENERGY COMPLIANCE

EN-101.00	ENERGY COMPLIANCE
	AV, IT AND SECURITY
ITS-001.00	AV, IT AND SECURITY LEGEND AND NOTES
ITS-100.00	AV, IT AND SECURITY LOWER LEVEL PLAN AND RCP
ITS-101.00	AV, IT AND SECURITY MAIN LEVEL PLAN AND RCP
ITS-102.00	AV, IT AND SECURITY MEZZANINE LEVEL PLAN AND RCP
ITS-201.00	IT ROOM DETAIL PLAN AND ELEVATION
ITS-202.00	MULTI-PURPOSE ROOM AV DETAILS
ITS-301.00	IT, SECURITY RISER DIAGRAM
ITS-302.00	PAGING RISER DIAGRAM
	ELEVATOR
VT-001.00	GENERAL ELEVATOR NOTES
VT-002.00	ELEVATOR PLANS AND SECTION
	CIVIL
C-201.00	SITE LAYOUT PLAN
C-301.00	GRADING & UTILITY PLAN
F0-100.00	TITLE SHEET
FO-101.00	CONSTRUCTION DETAILS
FO-102.00	CONSTRUCTION DETAILS
	SUPPORT OF EXCAVATION
SOE-100.01	TEMPORARY SUPPORT OF EXCAVATION COVER SHEET & INDEX TO DRAWINGS
SOE-101.01	TEMPORARY SUPPORT OF EXCAVATION GENERAL CONDITIONS, SPECIAL INSPECTIONS, MATERIAL NOTES AND SURVEY & MONITORING NOTES
SOE-102.01	TEMPORARY SUPPORT OF EXCAVATION CONSTRUCTION SEQUENCE
SOE-103.01	TEMPORARY SUPPORT OF EXCAVATION OVERALL PLAN VIEW
SOE-200.00	TEMPORARY SUPPORT OF EXCAVATION TYPICAL SECTION VIEWS (1 OF 2)
SOE-201.00	TEMPORARY SUPPORT OF EXCAVATION TYPICAL SECTION VIEWS (2 OF 2)
SOE-300.00	TEMPORARY SUPPORT OF EXCAVATION TYPICAL DETAILS (01 OF 02)
SOE-301.00	TEMPORARY SUPPORT OF EXCAVATION TYPICAL DETAILS (02 OF 02)
F0-100.00	UNDERPINNING COVER SHEET & INDEX TO DRAWINGS
FO-101.00	UNDERPINNING GENERAL CONDITIONS, SPECIAL INSPECTIONS, MATERIAL NOTES AND SURVEY & MONITORING NOTES
FO-102.00	UNDERPINNING CONSTRUCTION SEQUENCE
FO-103.00	UNDERPINNING OVERALL PLAN VIEW
FO-200.00	UNDERPINNING TYPICAL ELEVATION & SECTION VIEWS (1 OF 3)
FO-201.00	UNDERPINNING TYPICAL ELEVATION & SECTION VIEWS (2 OF 3)
FO-202.00	UNDERPINNING TYPICAL ELEVATION & SECTION VIEWS (3 OF 3)
FO-300.00	UNDERPINNING UNDERPINNING CONSTRUCTION DETAIL
FO-301.00	UNDERPINNING TYPICAL DETAILS
	ACM DOCUMENTS
H-001.00	ASBESTOS ABATEMENT GENERAL NOTES
H-002.00	ASBESTOS ABATEMENT MEZZANINE PLAN
	LEAD REMOVAL DOCUMENTS
LR-01	LEAD REMOVAL GENERAL NOTES
LR-02	LEAD REMOVAL LOWER LEVEL (BASEMENT) PLAN

LR-03	LEAD REMOVAL UPPER LEVEL (FIRST FLOOR) PLAN
LR-04	LEAD REMOVAL MEZZANINE PLAN
LR-05	LEAD REMOVAL STAIR CASE PLAN

SCHEDULE D

Electrical Motor Control Equipment

(Reference: 01 3506, Article 3.8 of the DDC Standard General Conditions)

Requirements for electrical motor equipment may be included in one or more sections of the Specifications for the Contract for the Project. Schedule D set forth below delineates specific information for electrical motor control equipment. In the event of any conflict between the Specifications and this Schedule D, Schedule D will take precedence; provided, however, in the event of an omission from Schedule D (i.e., Schedule D omits either a reference to or information concerning electrical motor equipment which is set forth in the Specifications), such omission from Schedule D will have no effect and the Contractor's obligation with respect to the electrical motor control equipment, as set forth in the Specifications, will remain in full force and effect.

DB Disconnect Circuit Breaker (Switch)
TS Thermal Switch
MS Magnetic Starter
CMS Comb. Mag. Starter
P Pilot Light
F Firestat
T Thermostat
AL Alternator
BG Break Glass Station
HOA Hand-Off Auto.
PB Push Button Station
RO Remote "off"

Equip. Ident.	Location	# of Units	HP or Watts MFA	Volts and Phase	Control Type: See legend above	Remarks:
CU-1	Ground Level (Rear Area)	1	20 MFA	208 V / 1 phase	CMS	NEMA 3R
DOAS-1	Basement Mech. Room	1	225 MFA	208 V / 3 phase	CMS	NEMA 3R
ACC-1	Ground Level (Rear Area)	1	70 MFA	208 V / 3 phase	CMS	NEMA 3R
ACC-2	Ground Level (Rear Area)	1	70 MFA	208 V / 1 phase	CMS	NEMA 3R
AC-1	Children's Area	1	15 AMPS	208 V/ 1 phase	DB	NEMA 1
AC-2	Reading Room	1	15 AMPS	208 V/ 1 phase	DB	NEMA 1
AC-3	Elev. Machine Room	1	15 AMPS	208 V/ 1 phase	DB	NEMA 1
AC-4	IT room	1	15 AMPS	208 V/ 1 phase	DB	NEMA 1
AC-5	Custodian Office	1	15 AMPS	208 V/ 1 phase	DB	NEMA 1
AC-6	Work Room	1	15 AMPS	208 V/ 1 phase	DB	NEMA 1
AC-7	Manager's Office	1	15 AMPS	208 V/ 1 phase	DB	NEMA 1
AC-8	Staff Room	1	15 AMPS	208 V/ 1 phase	DB	NEMA 1
AC-9	Periodicals Reading	1	15 AMPS	208 V/ 1 phase	DB	NEMA 1
AC-10	Adult Reading	1	15 AMPS	208 V/ 1 phase	DB	NEMA 1

AC-11	Teen Reading	1	15 AMPS	208 V/ 1 phase	DB	NEMA 1
AC-12	YALP	1	15 AMPS	208 V/ 1 phase	DB	NEMA 1
AC-13	Entrance Vestibule	1	15 AMPS	208 V/ 1 phase	DB	NEMA 1
TX-1	Attic	1	¾ HP	208 V/ 1 phase	CMS	NEMA 1
SF-1	Elev. Machine Room	1	¾ HP	208 V/ 1 phase	CMS	NEMA 1
EH-1	Sorting Room	1	1 kW	120 V/ 1 phase	DB	Integral with heater supplied by manufacturer
EH-2	Water Room	1	1 kW	120 V/ 1 phase	DB	Integral with heater supplied by manufacturer
EH-3	Electrical Room	1	1 kW	120 V/1 phase	DB	Integral with heater supplied by manufacturer
EH-4	Mech. Room	1	1 kW	120 V/1 phase	DB	Integral with heater supplied by manufacturer
WH-1	Basement Entrance	1	3 kW	208 V/ 3 phase	DB	Integral with heater supplied by manufacturer
WH-2	Basement Vestibule	1	3 kW	208 V/ 3 phase	DB	Integral with heater supplied by manufacturer
WH-3	Basement Multipurpose Rm	1	3 kW	208 V/ 3 phase	DB	Integral with heater supplied by manufacturer
EWH-1	Water Room	1	3 kW	208 V/ 3 phase	DB	NEMA 1
EWH-2	Janitor’s Closet	1	3 kW	208 V/ 3 phase	DB	NEMA 1
CP-1	Water Room	1	20 Watts	120V / 1 Phase	DB	NEMA 1
CP-2	Janitor’s Closet	1	20 Watts	120V / 1 Phase	DB	NEMA 1
SP-1	Elev. Sump Pit	1	1 HP	120 V /1 Phase	DBB	NEMA 1
Elevator Controller	Basement Elev. Machine Room	1	311 Amps (Full Load Amps)	208V /3 phase	400 AMP Lockable Fused Disconnect	NEMA 1

SCHEDULE E

Separation of Trades

NOT USED FOR SINGLE CONTRACTS

TABLE OF CONTENTS
CONTRACT #1 GENERAL CONSTRUCTION

01 91 119.43 EXTERIOR ENCLOSURE COMMISSIONING

DIVISION 02 - EXISTING CONDITIONS

02 41 19 SELECTIVE DEMOLITION
02 80 13 ALLOWANCE FOR INCIDENTAL ASBESTOS ABATEMENT
02 82 13 ASBESTOS ABATEMENT
02 83 19 LEAD BASED PAINT WORK PROCEDURES

DIVISION 03 - CONCRETE

03 15 00 CONCRETE ACCESSORIES
03 30 00 CAST-IN-PLACE CONCRETE
03 35 43 POLISHED CONCRETE FINISHING
03 54 16 HYDRAULIC CEMENT UNDERLAYMENT

DIVISION 04 - MASONRY

04 20 00 UNIT MASONRY

DIVISION 05 - METALS

05 12 00 STRUCTURAL STEEL FRAMING
05 12 13 ARCHITECTURALLY EXPOSED STRUCTURAL STEEL
05 31 00 STEEL DECKING
05 40 00 COLD-FORMED METAL FRAMING
05 50 00 METAL FABRICATIONS
05 52 13 PIPE AND TUBE RAILINGS
05 58 00 FORMED METAL FABRICATIONS
05 73 00 DECORATIVE METAL RAILINGS
05 73 13 GLAZED DECORATIVE METAL RAILINGS

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

06 10 00 ROUGH CARPENTRY
06 16 00 SHEATHING
06 41 16 PLASTIC LAMINATE CLAD ARCHITECTURAL CABINETS
06 61 16 SOLID SURFACE FABRICATIONS

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

07 11 13 BITUMINOUS DAMPPROOFING
07 13 26 SELF ADHERING SHEET WATERPROOFING
07 16 16 CRYSTALLINE WATERPROOFING
07 21 00 THERMAL INSULATION
07 27 26 FLUID APPLIED MEMBRANE AIR BARRIERS

07 31 26 SLATE SHINGLES
07 42 13.13 FORMED METAL WALL PANELS
07 42 13.16 METAL PLATE WALL PANELS
07 46 46 FIBER CEMENT SIDING
07 52 16 SBS MODIFIED BITUMINOUS MEMBRANE ROOFING
07 62 00 SHEET METAL FLASHING AND TRIM
07 72 36 SMOKE VENTS
07 72 73 VEGETATED ROOF SYSTEM
07 81 00 APPLIED FIREPROOFING
07 84 13 PENETRATION FIRESTOPPING
07 92 00 JOINT SEALANTS
07 95 00 EXPANSION CONTROL

DIVISION 08 - OPENINGS

08 11 13 HOLLOW METAL DOORS AND FRAMES
08 31 13 ACCESS DOORS AND FRAMES
08 41 13 ALUMINUM FRAMED ENTRANCES AND STOREFRONTS
08 44 13 GLAZED ALUMINUM CURTAIN WALLS
08 51 13 ALUMINUM WINDOWS
08 71 00 DOOR HARDWARE
08 80 00 GLAZING
08 81 26 INTERIOR GLASS GLAZING
08 83 00 MIRRORS
08 91 19 FIXED LOUVERS

DIVISION 09 - FINISHES

09 21 16 GYPSUM BOARD SHAFT WALL ASSEMBLIES
09 22 16 NON-STRUCTURAL METAL FRAMING
09 23 00 GYPSUM PLASTERING
09 29 00 GYPSUM BOARD
09 30 00 TILING
09 51 13 ACOUSTICAL PANEL CEILINGS
09 54 23 LINEAR METAL CEILINGS
09 65 00 RESILIENT FLOORING
09 65 13 RESILIENT BASE AND ACCESSORIES
09 67 23 RESINOUS FLOORING
09 68 13 TILE CARPETING
09 91 00 PAINTING

DIVISION 10 - SPECIALTIES

10 11 00 VISUAL DISPLAY UNITS
10 14 00 SIGNAGE
10 22 39 FOLDING PANEL PARTITIONS
10 28 13 TOILET ACCESSORIES
10 44 00 FIRE PROTECTION SPECIALTIES
10 75 00 FLAGPOLES

DIVISION 11 - EQUIPMENT

11 30 13 RESIDENTIAL APPLIANCES
11 51 00 LIBRARY EQUIPMENT

DIVISION 12 - FURNISHINGS

12 24 13 ROLLER WINDOW SHADES
12 36 00 COUNTERTOPS
12 48 13.13 ENTRANCE FLOOR MATS

DIVISION 14 - CONVEYING EQUIPMENT

14 24 00 HYDRAULIC ELEVATORS

DIVISION 22 – PLUMBING

22 05 00 COMMON WORK RESULTS FOR PLUMBING
22 05 23 GENERAL-DUTY VALVES FOR PLUMBING PIPING
22 05 29 HANGERS AND SUPPORTS FOR PLUMBING AND PIPING EQUIPMENT
22 05 53 IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT
22 07 00 PLUMBING INSULATION
22 08 00 COMMISSIONING FOR PLUMBING SYSTEMS
22 11 13 FACILITY WATER DISTRIBUTION PIPING
22 11 16 DOMESTIC WATER PIPING
22 11 19 DOMESTIC WATER PIPING SPECIALTIES
22 13 16 SANITARY WASTE AND VENT PIPING
22 13 19 SANITARY WASTE PIPING SPECIALTIES
22 14 13 FACILITY STORM DRAINAGE PIPING
22 14 23 STORM DRAINAGE PIPING SPECIALTIES
22 14 29 SUMP PUMPS
22 33 00 ELECTRIC DOMESTIC WATER HEATERS
22 40 00 PLUMBING FIXTURES

DIVISION 23 - HEATING VENTILATING AND AIR CONDITIONING

23 05 00 COMMON WORK RESULTS FOR HVAC
23 05 13 COMMON MOTOR REQ. FOR HVAC EQUIPMENT
23 05 29 HANGERS & SUPPORTS FOR HVAC PIPING & EQUIPMENT
23 05 48.13 VIBRATION CONTROLS FOR HVAC
23 05 53 IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT
23 05 93 TESTING, ADJUSTING AND BALANCING FOR HVAC
23 07 00 HVAC INSULATION
23 08 00 COMMISSIONING OF HVAC
23 09 00 INSTRUMENTATION AND CONTROL FOR HVAC
23 23 00 REFRIGERANT PIPING
23 31 13 METAL DUCTS
23 33 00 AIR DUCT ACCESSORIES
23 34 16 CENTRIFUGAL HVAC FANS

23 37 13 DIFFUSERS, REGISTERS AND GRILLES
23 63 13 AIR-COOLED REFRIGERANT CONDENSER
23 74 33 DEDICATED-OUTDOOR AIR UNITS
23 81 29 VARIABLE REFRIGERANT FLOW HVAC SYSTEMS
23 82 16.14 ELECTRIC-RESISTANCE AIR COILS
23 82 39.19 WALL AND CEILING UNIT HEATERS

DIVISION 26 – ELECTRICAL

26 05 00 COMMON WORK RESULTS FOR ELECTRICAL
26 05 19 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 05 26 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
26 05 29 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
26 05 33 RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS
26 05 53 IDENTIFICATION FOR ELECTRICAL SYSTEMS
26 05 73 POWER SYSTEM STUDIES
26 08 00 COMMISSIONING OF ELECTRICAL SYSTEMS
26 09 23 LIGHTING CONTROL DEVICES
26 24 16 PANELBOARDS
26 27 13 ELECTRICITY METERING
26 27 26 WIRING DEVICES
26 28 13 FUSES
26 28 16.13 ENCLOSED CIRCUIT BREAKERS
26 28 16.16 ENCLOSED SWITCHES
26 29 13 ENCLOSED CONTROLLERS
26 33 23 CENTRAL BATTERY EQUIPMENT
26 43 13 SURGE PROTECTIVE DEVICES FOR LOW-VOLTAGE ELECTRICAL POWER CIRCUITS
26 50 00 LIGHTING

DIVISION 27 – COMMUNICATIONS

27 10 00 STRUCTURED CABLING
27 41 00 AUDIO-VIDEO SYSTEMS

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

28 00 00 ELECTRONIC SAFETY AND SECURITY
28 08 00 COMMISSIONING OF ELECTRONIC AND SECURITY
28 46 20 FIRE ALARM

DIVISION 31 - EARTHWORK

31 20 00 EARTH MOVING
31 50 00 EXCAVATION SUPPORT AND PROTECTION

DIVISION 32 - EXTERIOR IMPROVEMENTS

32 01 90.33 TREE AND SHRUB PRESERVATION
32 05 13 SOILS FOR EXTERIOR IMPROVEMENTS

32 13 13 CONCRETE PAVING
32 31 13 CHAIN LINK FENCES AND GATES
32 31 19 DECORATIVE FENCES AND GATES
32 93 00 PLANTS
32 96 00 TRANSPLANTING

APPENDIX

Indemnification Agreement
Follow up Asbestos Investigation Services 04-07-22
Final Report of Asbestos Survey Services 06-18-2018
Existing Sewer As Built Survey 1988
Lead-Based Paint (LBP) Survey Services 08-28-2018
LEED V4 Project Checklist 08-01-22
GZA Geotechnical Engineering Geotechnical Report 03-13-23
Signage Package 02-20-2025

END OF TABLE OF CONTENTS

THIS PAGE INTENTIONALLY LEFT BLANK

CONTRACT # 1

GENERAL CONSTRUCTION WORK

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 91 19.43 - EXTERIOR ENCLOSURE COMMISSIONING

PART 1 - GENERAL

1.1. RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2. SUMMARY

A. Commissioning consists of systematically documenting that specified components and systems have been installed and started up properly and then functionally tested to verify and document proper operation through all sequences of operation and conditions. In addition, instruction of the City of New York's operations personnel must be verified and final project O&M Documents must be reviewed for completeness.

1.3. RELATED WORK

A. Reference Standards:

1. OSHA Part 1910; Subpart S. 1910.308.
2. American National Standards Institute: ANSI
3. American Architectural Manufacturers Association: AAMA
   a. AAMA 501.2 – Quality Assurance and Diagnostic Water leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems
4. American Society for Testing and Materials: ASTM
   a. ASTM E283 – Test Method For Determining The Rate Of Air Leakage Through Exterior Windows, Curtain Walls, And Doors Under Specified Pressure Differences Across The Specimen
   b. ASTM E330 – Test Method For Structural Performance Of Exterior Windows, Curtain Walls, And Doors By Uniform Static Air Pressure Difference
   c. ASTM E331 – Test Method For Water Penetrations Of Exterior Windows, Skylights, Doors, And Curtain Walls By Uniform Static Air Pressure Difference
   d. ASTM E783 – Test Method For Field Measurement Of Air Leakage Through Installed Exterior Windows And Doors
   e. ASTM E1105 – Test Method For Field Determination Of Water Penetration Of Installed Exterior Windows, Skylights, Doors And Curtain Walls By Uniform Or Cyclic Static Air Pressure Difference
   f. ASTM E1186 – Practice For Air Leakage Site Detection In Building Envelopes And Air Barrier Systems

B. All inspections and tests must use the following references.

1. Contract Specifications.
2. Contract Drawings.
3. Manufacturer's instruction manuals and approved shop drawings for applicable material.

C. Related Sections:

1. Section 07 11 13 – Bituminous Dampproofing
2. Section 07 13 26 – Self-adhered Sheet Waterproofing
3. Section 07 16 16 – Crystalline Waterproofing
4. Section 07 21 00 - Thermal Insulation
5. Section 07 27 26 – Fluid Applied Membrane Air Barriers
6. Section 07 31 26 – Slate Shingles
7. Section 07 42 13.13 – Formed Metal Wall Panels
8. Section 07 42 13.16 – Metal Plate Wall Panels
9. Section 07 52 16 – SBS Modified Bituminous Membrane Roofing
10. Section 07 62 00 –Sheet Metal Flashing and Trim
11. Section 07 92 00 – Joint Sealants
12. Section 08 11 13 – Hollow Metal Doors and Frames
13. Section 08 41 13 – Aluminum Framed Entrances and Storefronts
14. Section 08 44 13 - Glazed Aluminum Curtain Walls
15. Section 08 51 13 – Aluminum Windows

D. Building Enclosure Testing Matrix: see section 3.8 Building Enclosure Testing Matrix

1.4 DEFINITIONS/ SCOPE OF WORK

A. Refer to DDC general conditions section 01 91 13, General Commissioning Requirements for MEP systems, and DDC General Conditions Section 01 91 15 General Commissioning Requirements for Building Enclosure for definitions.

B. Commissioning of a system or systems specified in Division 04, Division 07 and Division 08 is part of the construction process. Documentation and testing of these systems, as well as instruction of the City of New York's operation and maintenance personnel, is required in cooperation with the City of New York and the Building Enclosure Commissioning Agent (BECA).

C. The following facility exterior enclosure systems must be commissioned:

1. Wall Openings:

a. Window and Curtain wall/Storefront Systems (mullions, glazing, and sealing)

b. Exterior Door Systems

2. Exterior Wall Assemblies

3. Air, Vapor, and Thermal Barriers

4. Roof Assemblies including roof insulation, membrane, air/vapor barrier, cants, flashings, and blocking

5. Joint Sealer

1.5 SUBMITTALS

A. The commissioning process requires review of selected submittals. The BECA must provide a list of submittals to be reviewed. This list must be reviewed by the Commissioner prior to forwarding to the Contractor. Refer to the DDC General Conditions Section 01 91 15 General Commissioning Requirements for Building Enclosure for further details.

B. The commissioning process requires a review of the submittals that is based on the scope of work outlined in the contract drawings and specifications. The specific submittal requirements related to the commissioning process are specified in the DDC General Conditions Section 01 91 15 General Commissioning Requirements for Building Enclosure.

PART 2 – PRODUCTS

2.1 EQUIPMENT AND INSTRUMENTS FOR COMMISSIONING PROCESS

A. The Contractor must hire an AAMA accredited Building Enclosure Testing Agency (BETA) to perform the requisite building envelope testing mentioned herein. This includes furnishing of all tools, instruments, laptops, calibrated meters, software programs, personnel, and services required to perform these tests. This includes providing the connection to systems to be tested, temporary alterations for test purposes, calibrations, operation of the test equipment & instrumentation and generating test results (as required), and the restoration of equipment/systems to original operating condition. A list of all tools and equipment to be used during commissioning must be submitted to the BECA for approval. The Contractor's proposed BETA is subject to review and approval by the Commissioner.

B. The Contractor must provide all scaffolding, lifts, ladders, etc. as required to access the test samples, as well as providing any required safety instruction for the testing agent required to access the samples.

C. The Contractor must provide all electrical power, water, and other utility services required by the BETA to perform the specified testing. The Contractor must provide the labor required to clean the area around the testing samples prior to and following the testing.

2.2. COMMISSIONING DOCUMENTATION

A. All documentation for the commissioning process must be entered into CxA's commissioning project progress tracking software tool. Contractor must be allowed web-based access to the software upon request. Additionally, the Contractor may download the CxA's mobile application to a tablet format. The mobile application is available in Apple, Android, and Windows format. There is no fee associated with the software or the mobile application. Contractor must allow sufficient time to familiarize themself with the operation of the software.

PART 3 – EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION GENERAL

A. The Contractor must complete all phases of work so the systems can be started, tested and acceptance procedures undertaken. This includes the complete installation of all building enclosure materials per the Contract Documents and related directives, clarifications, and change orders.

3.3 DEFICIENCY RESOLUTION

A. Corrective work must be completed in a timely fashion to permit the completion of the commissioning process. Experimentation to demonstrate system performance may be permitted. If the BECA deems the experimentation work to be ineffective or untimely as it relates to the commissioning process, the BECA must notify the Commissioner, indicating the nature of the problem, expected steps to be taken, and suggested deadline(s) for completion of activities. If the deadline(s) pass without resolution of the problem, the Commissioner reserves the right to obtain supplementary services and/or equipment to resolve the problem. Contractor must provide supplementary services incurred to solve problems at no additional cost to the City of New York.

3.4 PREFUNCTIONAL CHECKLISTS

A The installation system subcontractor must complete Pre-Functional Checklists (PFC) to verify systems, subsystems, and equipment installation are complete and systems are ready for systems Functional Performance Testing. The BECA must prepare Pre-Functional Checklists to be used to document equipment installation. The Contractor must complete the checklists. Completed checklists must be submitted to the BECA for review prior to Functional Performance Testing. The BECA must check all of the completed checklists. If the BECA determines that the information provided on the checklist is not accurate, the BECA must return the marked-up checklist to the Contractor for correction and resubmission. If the BECA determines that a significant number of completed checklists for similar building envelope assemblies is not accurate, the BECA must select a broader sample of checklists for review. If the BECA determines that a significant number of the broader sample of checklists is also inaccurate, all the checklists for the type of equipment must be returned to the Contractor for correction and resubmission. Refer to DDC General Commissioning Requirements for Building Enclosure for submittal requirements for other commissioning documents.

3.5 FUNCTIONAL PERFORMANCE TESTING

A. The BECA must provide to the Contractor blank functional performance tests (FPTs). The Contractor must review the test procedures, so that proper preparation may occur. The Contractor must execute the FPT document, perform the test and prove to the Commissioner and the BECA that the performance of the Building Enclosure Systems achieves the performance level identified. The Contractor must provide the required labor, materials, and test equipment identified in the test procedure to perform the tests. The BECA must witness and document all of the BECA specified testing. The Contractor must sign the test reports to verify tests were performed. The systems to be performance tested include but are not limited to the following:

1. Building Enclosure:
   a. Exterior wall assemblies (included in the tests below)
   b. Windows – 2 tests (1 at existing building and 1 at new addition)
   c. Curtain Wall system – 1 test (at new addition)
   d. Low-slope roof membrane (SBS modified bituminous) – 1 test of new addition roof (100% of roof area)

B. Detailed testing must be performed on all installed building enclosure material and/or systems to ensure that operation and performance conform to the Contract Documents. All tests must be witnessed by the BECA.

C. One test, for each system listed below, needs to take place after the installation of the first system. Moreover, at least one test needs to be performed, per system, prior to completing 10% of the installation, also at least two tests need to performed prior to completing 30% and 50% of each systems installation.

D. The Contractor must execute the following tests and guidelines below:

1. Wall Openings
   a. Window/Curtain wall systems: (3) tests
   b. Test method: AAMA 502 for windows, AAMA 503 for curtain wall (inclusive of ASTM E783 and ASTM E1105)
   c. Test chambers and spray racks need to be at least 5% larger than the opening being tested. Refer to the Section 3.8 titled, Building Enclosure Testing Matrix.
2. Roof (addition only)
   a. SBS modified bituminous roof membrane: (1) test – 100% of roof area at new addition
3. Acceptance criteria must be in accordance with the manufacturers, AAMA, ASTM or specified allowances.
4. Window/curtain wall sampling methodology demonstrates that the window installation (as installed) meets performance class acceptance standards. Testing randomly selected windows/curtain wall demonstrates that the window/storefront/curtain wall installation process is uniform and repeatable, all the while, meets performance class acceptance standards. Testing Final Piece Randomly Selected windows demonstrates that the window restoration process (as installed in its completely finished configuration) is uniform and repeatable, all the while, meets performance class acceptance standards and conforms with Section 3.5.2 (Sampling) AAMA 502 and AAMA 503.
   a. Sampling methodology for window testing
   b. Conform to Section 3.5.2 (Sampling) AAMA502 and AAMA 503.
   c. First Piece – Test the first window installed of each window type to ensure that the window achieves satisfactory performance. The window must be tested with final finish, hardware and trim pieces (permissible exceptions - the screen, shade & stool may not be in place at the time of testing.) The test chamber and test must be conducted in compliance with AAMA 502/503 & ASTM E-783.
   d. Random In-Line Inspection –The BECA and the Commissioner must work together to randomly select one window of each type for performance testing. The window must be tested

with final finish, hardware and trim pieces. The screen, shade & stool may not be in place at the time of testing. The test chamber and test must be conducted in compliance with AAMA 502/503 & ASTM E-783.

e. Final Piece Randomly Selected - The BECA and the Commissioner must randomly select one window of each type for performance testing. The window must be tested with finished hardware. The screen, shade & stool may not be in place at the time of testing. The test chamber and test must be conducted in compliance with AAMA 502/503 & ASTM E-783.

f. Refer to the Section 3.8 titled, Building Enclosure Testing Matrix.

E. Failure of On-Going Building Enclosure Field Testing

1. Upon a failure of a test during on-going building enclosure testing:

a. Stop all enclosure testing and find out the cause of the failure.

b. Determine if this failure was an isolated incident, or if it affects more than one system area.

c. Repair all related systems once issue has been determined.

d. After repairs have been made to all similar systems, rerun the test to confirm system performance.

e. When the systems pass, resume testing.

f. Upon failure of a window, increase the sample size from the initial sample rate by two windows, at no additional cost to the City of New York.

g. The new sample rate would continue until three (3) subsequent test groups pass, and then would revert to the previous sample rate.

h. Each additional failure would increase the sample rate three (3) times the previous sample rate, up to a 100% sample rate. Each new sample rate would continue until three (3) subsequent test groups pass, and then would revert to the previous sample rate.

i. In the event of any conflict between the other Contract Documents and the foregoing minimum criteria, the more stringent must govern.

j. Costs of additional testing and retesting triggered by a failure must not be borne by the City of New York or the BECA.

3.6 ROLES AND RESPONSIBILITIES

A. Contractor

1. Assure acceptable representation, with the means and authority to prepare and coordinate execution of the Building Enclosure system commissioning program as described in the Contract Documents.
2. Attend commissioning meetings scheduled by the BECA.
3. Coordinate inclusion of commissioning activities in the construction schedule.
4. Complete Pre-Functional Checklists prior to scheduling testing of the Building Enclosure system.
5. Issue a notice that Building Enclosure pre-testing has been scheduled.
6. Monitor, respond, and remedy deficiencies identified in the Corrective Issue Reports (CIRs) distributed by the BECA in order to expedite corrective actions necessary to achieve design intent.
7. Facilitate resolution of deficiencies that were identified by observations or performance testing.
8. Participate in the Functional Performance Tests as required to achieve design intent.

9. Participate in O&M Instruction as required by the DDC General Conditions Section 017839 Contract Record Documents and DDC General Conditions Section 019115 General Commissioning Requirements for Building Enclosure.
10. Include requirements for submittal data, O & M data, and instruction in each purchase order or sub-contract written.
11. Ensure cooperation and participation of major manufacturers in appropriate instruction and testing activities.
12. Attend Construction Phase coordination meeting scheduled by the BECA.
13. Assist the BECA in all verification and functional performance tests.
14. Prepare preliminary schedule and include the following tasks that must be executed: Building Enclosure system orientation and inspections, O&M manual submission, instruction sessions, and task completion for use by the BECA. Update schedule as appropriate throughout the construction period.
15. Attend initial instruction session.
16. Conduct Building Enclosure system orientation and inspection at the equipment placement completion stage.
17. Update drawings to the record condition to date, and review with the BECA.
18. Gather O&M data on all equipment, and assemble in binders as required by the DDC General Conditions Section 017839 Contract Record Documents and DDC General Conditions Section 019115 General Commissioning Requirements for Building Enclosure.
19. Notify the BECA a minimum of two weeks in advance, so that witnessing building enclosure testing can begin.
20. Notify the BECA a minimum of two weeks in advance before the installation of the first system.
21. Participate in and schedule vendors to participate in the instruction sessions.
22. Provide written notification to the Commissioner and BECA that the following work has been completed in accordance with the Contract Documents, and that the systems and sub-systems are operating as required.
    a. Prior to completing 10% of each system installation.
    b. Prior to completing 30% of each system installation.
    c. Prior to completing 50% of each system installation.

23. Provide a complete set of as-built records to the BECA.

3.7 TEST REPORTS

A. Provide copies of all reports required per set forth in the referenced test procedure, for review.
B. Provide the information listed below.

1. Report the following information for ASTM E 783:
    a. Testing agency, requester of test, date and time of test, date of report, identification, and location of building.
    b. Test specimen description.
    c. Detailed drawings of the specimen (if available).
    d. Sampling procedures.
    e. Test parameters.

f. Ambient test conditions.

g. Pressure differences and Leakage.

2. Report the following information for ASTM E 1186:

a. Testing agency, requester of test, date and time of test, date of report, identification, and location of building.

b. Test specimen description.

c. Detailed drawings of the specimen (if available).

d. Sampling procedures.

e. Test parameters.

f. Ambient test conditions.

g. The direction of movement of the smoke trace.

3. Report the following information for ASTM E1105:

a. Testing agency, requester of test, date and time of test, date of report, identification, and location of building.

b. Test specimen description.

c. Detailed drawings of the specimen (if available).

d. Sampling procedures.

e. Test parameters.

f. Test conditions.

g. Test results.

h. Compliance statement.

i. Calculations, including:

1. The leakage coefficient and pressure exponent for both pressurization and de-pressurization.

2. The effective leakage area. Report if a reference pressure other than 4 Pa is used.

3. An estimate of the confidence limits.

3.8 BUILDING ENCLOSURE TESTING MATRIX

Spec Section	Standard Designation & System	Title	Lab System Testing	Field Mockup Testing[A]	On-Site Field Testing	Responsibility For testing			Completed	Failure Criteria/ Testing Notes
						CxA	Contractor	City of New York		
Air Infiltration										
08 44 13, 08 51 13, 08 41 13	ASTM E783 (AAMA 502,503) *Curtain wall, Windows*	Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors	…	…	(3X)	(WS)		…		Test pressure per 08 44 13 and 08 51 13.
08 51 13, 08 44 13	ASTM E1186	Practice for Air Leakage Site Detection in Building Envelopes, Rain Screen Wall Systems, and Air Barriers Systems	…	…	Possible	(WS)		…		To be used only in the event of a failure

Spec Section	Standard Designation & System	Title	Lab System Testing	Field Mockup Testing[A]	On-Site Field Testing	Responsibility For testing			Completed	Failure Criteria/ Testing Notes
						CxA	Contractor	City of New York		
Water Infiltration										
08 51 13, 08 44 13, 08 41 13	ASTM E1105 (AAMA 502, 503) *Windows/ Curtain wall*	Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform or Cyclic Static Air Pressure Difference	…	…	(3X)	(WS)		…		Test pressure per spec section.
07 52 16	ASTM D7877 *Low slope single ply roof membranes*	Standard Guide for Detecting and Locating Leaks in Waterproof Membranes	…	…	(1X)	(WS)		…		No breaches in membrane

[A] Including both off-building and "first installation" on-building mockups.

[B] Typically performed in conjunction with Test Method E1105 in AAMA 502

[C] A job-specific laboratory test may be recommended by the BECA based on climate and enclosureesigns with increased condensation risk (that is, thermal bridges across the enclosure including curtain walls incorporating fins or structural elements that extend through the thermal barrier).

[D] A modified AAMA 1503 test may be performed in the field.

[E] In conjunction with required water penetration resistance testing of roofing and as appropriate for specific roofing assembly.

[F] Depending upon roofing type and installation, Electronic Leak Detection (ELD) or Nuclear Radioisotopic Thermalization may also be considered to supplement or replace this evaluation.

[G] This test serves as an alternate to the Field Dynamic testing as listed in AAMA 501.1 . The number of tests recommended do not align (are less then) AAMA 501.1 as this practice requires construction of a chamber to provide a differential pressure.

[H] Use either E779 or E1827 not both.

[I] Run in conjunction with E779 or E1827.

Notes:

Note 1 - Areas of the table marked by leaders ("…") indicate test methods that are not applicable.

Note 2 - "L" indicates that a job-specific laboratory test is required.

Note 3 - "OL" indicates an optional laboratory test.

Note 4 - "(OF)" indicates an optional field test.

Note 5 - "(M)" indicates a laboratory pre-construction mock-up test included in or otherwise available for consideration as part of Practice E2099.

Note 6 - "□" indicates a mandatory field test followed by the minimum number of tests required for each unique material, component, system, or assembly.

Note 7 - "ref" indicates reference standard or guidance.

Note 8 - "(WS)" Witness some testing & Document results.
* This table is a modified Table A2.1 from ASTM E2813

END OF SECTION 01 91 19.43

SECTION 02 41 19 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract."

1.2 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.
3. Salvage of existing items to be reused or recycled.

1.3 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to City of New York that may be uncovered during demolition remain the property of City of New York.

1. Carefully salvage in a manner to prevent damage and promptly return to City of New York.

1.4 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.6 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

B. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by salvage and demolition operations.

1.7 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 "Quality Requirements."

1.9 FIELD CONDITIONS

A. Notify Commissioner of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

B. Storage or sale of removed items or materials on-site is not permitted.

C. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

1.10 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with City of New York's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of New York City Department of Buildings and DOT.

B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

3.3 PREPARATION

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82.

3.4 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Arrange to shut off utilities with utility companies.
2. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.

a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
b. Equipment to Be Removed: Disconnect and cap services and remove equipment.
c. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

3.5 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.

4. Cover and protect furniture, furnishings, and equipment that have not been removed.
5. Comply DDC General Conditions for requirements of temporary enclosures, dust control, heating, and cooling.

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

C. Remove temporary barricades and protections where hazards no longer exist.

3.6 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work according to New York City Department of Building regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
5. Maintain fire watch during and for at least 24 hours after flame-cutting operations unless otherwise required by the Building Code.
6. Maintain adequate ventilation when using cutting torches.
7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
10. Dispose of demolished items and materials promptly. Comply with DDC General Conditions.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to City of New York.
4. Transport items to City of New York's storage area designated by City of New York.
5. Protect items from damage during transport and storage.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Commissioner, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.7 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.

3.8 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
4. Comply with DDC General Conditions.

B. Burning: Do not burn demolished materials.

3.9 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 02 41 19

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 02 80 13 – GENERAL CONTRACTOR WORK
NOVEMBER 2017 VERSION

ALLOWANCE FOR INCIDENTAL ASBESTOS ABATEMENT

1.01 SCOPE FOR ASBESTOS ABATEMENT WORK

A. The "General Conditions" apply to the work of this Section.

B. The asbestos abatement contractor shall remove asbestos containing materials as needed to perform the other work of this Contract when discovered during the course of work. When required, the asbestos abatement contractor shall replace the ACM with non-asbestos containing materials. An allowance of **$15,000.00** for the **General Contractor** is herein established for this incidental work when so ordered and authorized by the Commissioner.

C. All work shall be done in accordance with the applicable provisions of the rules and regulations of the asbestos control program as promulgated by Title 15 Chapter I of RCNY and New York State Department of Labor Industrial Code Rule 56 cited as 12 NYCRR Part 56, whichever is more stringent as per latest amendments to these laws and as modified herein by these specifications.

D. All disposal of asbestos contaminated material shall be per Local Law 70/85.

E. The asbestos abatement contractor's attention is directed to the fact that certain methods of asbestos abatement are protected by patents. To date, patents have been issued with respect to "negative pressure enclosure" or “negative-air” or "reduced pressure” and "glove bag".

F. The asbestos abatement contractor shall be solely responsible for and shall hold the Department of Design and Construction and the City harmless from any and all damages, losses and expenses resulting from any infringement by the asbestos abatement contractor of any patent, including but not limited to the patents described above, used by the asbestos abatement contractor during performance of this agreement.

G. "Asbestos" shall mean any hydrated mineral silicate separable into commercially usable fibers, including but not limited to chrysotile (serpentine), amosite (cumingtonite-grunerite), crocidolite (riebeckite), tremolite, anthrophyllite and actinolite.

H. Prior to starting, the asbestos abatement contractor must notify the Commissioner of the Department of Design and Construction if he/she anticipates any difficulty in performing the Work as required by these Specifications. The asbestos

abatement contractor is responsible to prepare and submit all filings, notifications, etc. required by all City, State and Federal regulatory agencies having jurisdiction.

The asbestos abatement contractor is responsible for submitting the Asbestos Project Notification Form (ACP-7 Form) to the Department of Environmental Protection, Asbestos Control Program, as per Title 15, Chapter I of RCNY and to the NYSDOL as per Industrial Code Rule 56.

The asbestos abatement contractor is responsible for preparing, and submitting Asbestos Variance Application (ACP-9). If a Variance is required, the asbestos abatement contractor is responsible to retain a NYSDOL Asbestos Project Designer, as defined in Title 15, Chapter 1 of the RCNY to prepare and submit the required variance.

The general contractor is responsible for preparing and submitting an Asbestos Abatement Permit and/or Work Place Safety Plans (WPSP) that may be required for the completion of the Contract or incidental work. If such plans are required, the general contractor is responsible for retaining a registered design professional as defined in Title 15, Chapter 1 of the RCNY to prepare and submit the required plans.

The asbestos abatement contractor is responsible for the submission of all required documents to the NYCDEP to acquire the appropriate Asbestos Project Conditional Closeout (ACP-20) and/or Asbestos Project Completion Forms (ACP-21) on a timely basis for the completion of the incidental work encountered under this contract.

The asbestos abatement contractor will be required to attend an on-site job meeting with the Construction Project Manager prior to the start of work to examine conditions and plan the sequence of operations, etc.

The asbestos abatement contractor shall have a NYSDOL/NYCDEP Asbestos Supervisor onsite to oversee the work and conduct a final visual inspection as required by both Title 15, Chapter 1 of the RCNY and NYSDOL Industrial Code Rule 56.

I. All work shall be done during regular working hours unless the asbestos abatement contractor requests authorization to work in other then regular working hours and such authorization is granted by the Commissioner. (Regular work hours are those hours during which any given facility, in which work is to be done, is customarily open and functioning, normally between the hours of 8:00 A.M. and 4:00 P.M. Monday - Friday.) If such work schedule is authorized by the Commissioner, the work shall be done at no additional cost to the City.

J. The Commissioner may order that work be done in other than regular working hours as herein by defined and this order may require the asbestos abatement

contractor to pay premium or overtime wages to complete the work. If the Commissioner orders work in other than regular working hours, the asbestos abatement contractor shall multiply the unit price for that portion of the work requiring premium wages by 1.50 when computing payment in accordance with Paragraph 1.09. All requests for premium payment must be supported by certified payroll sheets and field sheets approved by the Construction Project Manager.

1.02 QUALIFICATIONS OF ASBESTOS ABATEMENT CONTRACTOR

A. Requirements: The asbestos abatement contractor must be approved through the Department's Request for Subcontractor Approval, administered by the Agency Chief Contracting Office (ACCO), Vendor Integrity Unit. The asbestos abatement contractor must demonstrate compliance with the special experience requirements set forth in subparagraphs (1) through (6) below. Such documentation shall include without limitation, all required licenses, certificates, and documentation.

1. The asbestos abatement contractor must, whether an individual, corporation, partnership, joint venture or other legal entity, demonstrate for the three year period prior to the work that it has been licensed by the New York State Department of Labor (NYSDOL), as an "Asbestos Abatement Contractor". The asbestos abatement contractor shall submit copies of the asbestos abatement contractors NYSDOL License for the past three years

2. The asbestos abatement contractor must, for the three-year period prior to the work, have been in the business of providing asbestos abatement services as a routine part of its daily operations.

3. The asbestos abatement contractor proposing to do asbestos abatement work must be thoroughly experienced in such work and must submit a list of five (5) asbestos abatement projects of similar size and complexity. The aggregate cost of these projects must be at least $1,000,000 in each of the three years.

4. For each project submitted to meet the experience requirements set forth above, the asbestos abatement contractor must submit the following information for the project; name and location of the project; name title and telephone number and email address of the owner or the owner's representative who is familiar with the asbestos abatement contractor's work; brief description of the scope of work completed as a prime or sub-asbestos abatement contractor; amount of contract or subcontract and the date of completion.

5. The asbestos abatement contractor must demonstrate that it has the financial resources, certified supervisory personnel and equipment

necessary to carry out the work and to comply with the required performance schedule, taking into consideration other business commitments. The asbestos abatement contractor must submit such documentation as may be required by the Department of Design and Construction to demonstrate that it has the requisite capacity to perform the required services of this contract. The Department may also conduct an inspection of the asbestos abatement contractor's facility to verify if the contractor has equipment and staffing to perform the work.

6. The asbestos abatement contractor must submit a copy of their Corporate Health and Safety Plan for review and acceptance. A Job Hazard Analysis (JHA) for the specific work conducted must be included.

B. Throughout the specifications, reference is made to codes and standards which establish qualities and types of workmanship and materials, and which establish methods for testing and reporting on the pertinent characteristics thereof. Provide materials or workmanship that meet or exceed the specifically named codes or standards where required by these specifications.

C. Site Investigation: Asbestos abatement contractor shall inspect all the specifications and related drawings, and will investigate and confirm the site conditions affecting the work, including, but not limited to (1) through (5) below. The asbestos abatement contractor will attend a walkthrough site inspection with the department's Project Manager and the Third-Party Air Monitor prior to the work. Such walkthrough will be scheduled at the Department's convenience.

1. Physical considerations and conditions of both the material and structure. These considerations include any obstacles or obstructions encountered in accessing or removing the material.

2. Handling, storage, transportation and disposal of the material.

3. Availability of qualified and skilled labor.

4. Availability of utilities.

5. Exact quantities of all materials to be disturbed and/or removed

1.03 ASBESTOS ABATEMENT CONTRACTOR RESPONSIBILITIES

The asbestos abatement contractor will visit the subject location within one (1) working day of notification to ascertain actual work required. If the project is identified as being "urgent", then work shall commence no later than 48 hours from the time of notification. In this event, the asbestos abatement contractor shall immediately notify when applicable EPA NESHAPS Coordinator, NYSDOL Asbestos Control Bureau and NYCDEP

Asbestos Control Program of start of the work and file the necessary Asbestos Notifications and any applicable Variance Applications with the regulatory agencies cited above.

In the event that the project is not classified as "urgent" the asbestos abatement contractor shall notify the EPA NESHAPS Coordinator, NYSDOL and NYCDEP by submitting the requisite asbestos project notification forms, postmarked 10 days before activity begins if 260 linear feet or more and/or 160 square feet or more of asbestos containing material will be disturbed.

The following information must be included in the notification:

A. Name and address of building City or operator;

B. Project description:

1. Size - square feet, number of linear feet, etc;

2. Age - date of construction and renovations (if known);

3. Use - i.e., office, school, industrial, etc.

4. Scope - repair, demolition, cleaning, etc.

C. Amount of asbestos involved in work and an explanation of techniques used to determine the amount;

D. Building location/address, including Block and Lot numbers;

E. Work schedule including the starting and completion dates;

F. Abatement methods to be employed;

G. Procedures for removal of asbestos-containing material;

H. Name, title and authority of governmental representative sponsoring project.

1.04 WORK INCLUDED IN UNIT PRICE

The asbestos abatement contractor will be paid a basic unit price of **$25.00** per square feet for the removal and disposal of asbestos containing material and replacement of the same with non-asbestos containing materials.

Unit price shall include all costs necessary to do the work of this Contract, including but not limited to: labor, materials, equipment, utilities, disposal, insurance, overhead and profit.

1.05 AIR MONITORING – ASBESTOS ABATEMENT CONTRACTOR

A. "Air Sampling" shall mean the process of measuring the fiber content of a known volume of air collected during a specific period of time. The procedure utilized for asbestos follows the NIOSH Standard Analytical Method 7400 or the provisional transmission electron microscopy methods developed by the USEPA and/or National Institute of Standard and Technology which are utilized for lower detectability and specific fiber identification.

B. Air monitoring of asbestos abatement contractor's personnel will be performed in conformance with OSHA requirements, (All costs associated with this work are deemed included in the unit price.).

C. Qualifications of Testing Laboratory:

The industrial hygiene laboratory shall be a current proficient participant in the American Industrial Hygiene Association (AIHA) PAT Program. The laboratory identification number shall be submitted and approved by the City. The laboratory shall be accredited by the AIHA and New York State Department of Health Environmental Laboratory Approval Program (ELAP).

Note: Work area air testing and analysis before, during and upon completion of work (clearance testing) will be performed by a Third Party Air Monitor under separate Contract with the City.

1.06 THIRD PARTY MONITORING AND LABORATORY

A. The NYCDDC, at its own expense, will employ the services of an independent Third Party Air Monitoring Firm and Laboratory. The Third Party Air Monitor will perform air sampling activities and project monitoring at the Work Site.

B. The Laboratory will perform analysis of air samples utilizing Phase Contrast Microscopy (PCM) and/or Transmission Electron Microscopy (TEM).

C. The Third Party Air Monitoring Firm and the designated Project Monitor shall have access to all areas of the asbestos removal project at all times and shall continuously inspect and monitor the performance of the asbestos abatement contractor to verify that said performance complies with this Specification. The Third-Party Air Monitor shall be on site throughout the entire abatement operation.

D. The NYCDDC will be responsible for costs incurred with the Third Party Air Monitoring Firm and laboratory work. Any subsequent additional testing required due to limits exceeded during initial testing shall be paid for by the asbestos abatement contractor.

1.07 PAYMENT REQUEST DOCUMENTATION

B. The following information shall be included for each payment request:

1. Description of work performed.

2. Linear footage and pipe sizes involved.

3. Square footage for boiler & breaching insulation removed.

4. Square footage of non pipe and boiler areas removed, patched, enclosed, sealed, or painted.

5. Square footage of encapsulation, sealing, patching, and painting involved.

6. Total cost associated with compliance with the assigned task.

7. Architectural, Electrical, HVAC, Plumbing, etc. work incidental to the Asbestos Abatement Work.

8. A certified copy (in form 4312-39) to the Comptroller or Financial Officer of the New York City to the effect that the financial statement is true.

9. A signed copy (in form 6506q-6) of certificate of compliance with non-discriminatory provisions of the Contract.

10. Attach a copy of valid workmen compensation insurance.

11. Valid asbestos insurance per occurrence.

12. General liability insurance when required.

C. Each payment request shall include a grand total for all work completed that billing period, the landfill waste manifests and a copy of waste transporter permit. The Department of Design and Construction will inspect the work performed, review the cost and approve or disapprove requests for payment.

D. EXPOSURE LOG: With this final payment, the asbestos abatement contractor shall submit a listing of the names and social security numbers of all employees actively engaged in the abatement work of this Contract. This list shall include a summary showing each part of the abatement work in which the employee was engaged and the dates thereof.

1.08 QUANTITY CALCULATIONS

In order to determine the square footage involved for the various pipe sizes of pipe insulation that might be encountered, the following table is to be used.

PIPE INSULATION SIZE O.D.	PIPE SIZE O.D.	SQUARE FOOTAGE PER LINEAR FOOT
2-1/2"	1/2"	0.65
2-3/4"	3/4"	0.72
3"	1"	0.79
3-1/4"	1-1/4"	0.85
3-1/2"	1-1/2"	0.92
4"	2"	1.05
4-1/2"	2-1/2"	1.18
5”	3”	1.31
6"	3-1/4"	1.57
7"	3-1/2"	1.83
8"	4"	2.09
9”	5"	2.36
10"	6"	2.62
12"	8"	3.14
14"	10"	3.67
16"	12"	4.19
18"	l4”	4.71

1.09 METHOD OF PAYMENT

Payment shall be made in accordance with Items A through R below. Payment shall be calculated based on the actual quantity of the item performed by the asbestos abatement contractor, times the unit price specified below. Credits may apply to certain times, as specified below.

A. **REMOVAL, DISPOSAL AND REPLACEMENT OF ASBESTOS CONTAINING PIPE INSULATION:** Actual linear footage, multiplied by the square footage factor listed for the respective pipe size in Section 1.08, multiplied by the unit price in Section 1.04.

EXAMPLE: 100 lin.ft. of 1/2" pipe and 100 lin.ft. of 6" pipe, including elbows, tees. Flanges, etc.

100 X 0.65 = 65 sq.ft. 65 x unit price = Payment

100 X 2.62 = 262 sq.ft. 262 x unit price = Payment

B. **REMOVAL, DISPOSAL AND REPLACEMENT OF BOILER INSULATION:** (all types including Silicate Block and including the removal/replacement of metal jacketing) Payment shall be made at 1.5 times the unit price per square foot.

EXAMPLE: Item B. removal and replacement of 1000 S.F. of boiler insulation (incl. Silicate block)

1000 S.F. X (1.5) X the Unit Price = Payment

C. **REMOVAL, DISPOSAL AND REPLACEMENT OF TANK INSULATION:** (all types including removal/replacement of metal jacketing) Payment shall be made at 1.5 times the unit price per square foot.

D. **REMOVAL, DISPOSAL AND REPLACEMENT OF BOILER UPTAKE, & BREACHING INSULATION:** (all types including stiffening angles and wire lath) Payment shall be made at 2.0 times the unit price per square foot.

E. **REMOVAL, DISPOSAL AND REPLACEMENT OF DUCT INSULATION:** Payment shall be made at 1.0 times the unit price per square foot.

F. **REMOVAL, DISPOSAL AND REPLACEMENT OF SOFT ASBESTOS CONTAINING MATERIAL:** (Including sprayed-on fire proofing and sound proofing) Payment shall be made at 1.0 times the unit price per square foot of surface area. Area of irregular surfaces must be calculated and confirmed with DDC representative.

G. **ACOUSTIC PLASTER REPAIR AND/OR ENCAPSULATION:** Payment shall be made at 0.5 times the unit price per square foot.

H. **PATCHING OR REPAIR** of items listed in A through F will be paid at 0.33 times the unit price per square foot.

I. **REMOVAL, DISPOSAL AND REPLACEMENT OF WATERPROOFING ASBESTOS CONTAINING MATERIAL: (**including friable and non-friable waterproofing material from interior and exterior walls, floors, foundations, penetrations, louvers, vents and openings other than windows, doors and skylights) Payment shall be made at 0.5 times the unit price per square foot.

J. **REMOVAL, DISPOSAL AND REPLACEMENT OF ASBESTOS CONTAINING ELECTRICAL WIRING INSULATION:** (including friable and non-friable wiring insulation) Payment shall be made at 0.33 times the unit price per square foot.

K. **PAINTING:** Payment shall be made at 0.05 times the unit price per square foot.

L. **REMOVAL AND DISPOSAL OF ASBESTOS-CONTAINING PLASTER:** from ceilings and walls, including any wire lath and disposal as asbestos containing waste. Payment shall be made at 0.80 times the unit price per square foot.

M. **REMOVAL AND DISPOSAL OF ASBESTOS-CONTAINING FLOOR TILES, CEILING TILES, TRANSITE PANELS:** (including any adhesive, glue, mastic and/or underlayment) and disposal as asbestos containing waste. Payment shall be made at 0.40 times the unit price per square foot. If multiple

layers are discovered, each additional layer shall be paid at 0.20 times the unit price per square foot.

N. **ADDITIONAL CLEAN UP/HOUSEKEEPING OF WORK AREA:** (excluding pre-cleaning of work area required by regulations) HEPA vacuuming and wet cleaning of asbestos contaminated surface. Payment shall be made at 0.20 times the unit price per square foot. When GLOVE BAG is employed to remove ACM, cost of HEPA vacuuming and wet cleaning of floor area up to 3 feet on each side of glove-bag shall be included in unit price and no extra payment will be made.

O. **REMOVAL, DISPOSAL OF ASBESTOS-CONTAINING ROOFING MATERIAL:** including mastic, flashing and sealant compound and provide temporary asbestos-free roof covering consisting of one layer of rolled roofing paper sealed with asphaltic roofing compound. Payment shall be made at 0.8 times the unit price per square foot. Credit at a rate of 0.33 times the unit price will be taken for each square foot of temporary roof covering which the asbestos abatement contractor is directed not to install.

P. **PICK-UP AND DISPOSAL OF GROSS DEBRIS:** (excluding any waste generated from abatement under Item A-R) at a rate of $150 per cubic yard for asbestos contaminated waste and $75 per cubic yard for non-asbestos contaminated waste. This cost includes all labor and material cost associated with work.

Q. **REMOVAL OF ASBESTOS-CONTAINING BRICK, BLOCK, MORTAR, CEMENT OR CONCRETE:** along with all surfacing materials including wire lath and/or other supporting structures and disposal as ACM waste. Payment shall be made at a rate of $25.00 per cubic foot of material removed.

R. **REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING WINDOW/DOOR CAULKING:** including friable and non-friable caulking, weather-stripping, glazing, sealants or other waterproofing materials applied to windows, doors, skylights, etc. Payment shall be made at the rate of $400.00 per opening regardless of size or configuration. This cost includes labor, consumable materials, set-up/breakdown, removal and disposal, as required.

Note 1: CREDIT: For items listed in A through F, a credit at a rate of 0.33 times the unit price, times the respective multiplier (for each item) will be taken for each square foot of insulation which the asbestos abatement contractor is not directed to reapply.

Note 2: MINIMUM PAYMENT: The minimum payment per call at any individual job sites or various job sites during the same day will be eight hundred dollars ($800.00).

Note 3: All payments shall be made as described in paragraph 1.09 herein**.**

Note 4: WORKING HIGHER THAN 12 FEET ABOVE FLOOR LEVEL OR WORK REQUIRING COMPLEX SCAFFOLDING OR CONSTRUCTION WORK

PLATFORMS: Provisions are made in this Contract to compensate the asbestos abatement contractor for work performed in locations that are difficult to access due to work at elevations that are significantly higher than the normal work level. The unit price for these items will be paid at 1.20 times the unit price described in Paragraphs 1.09, A through R for those portions of the work that are more than twelve (12) feet above the grade for that would be judged as the normal working level.

1.10 GUARANTEE

A. Work performed in compliance with each task shall be guaranteed for a period of one year from the date the completed work is accepted by the Department of Design and Construction.

B. The Commissioner of The Department of Design and Construction will notify the asbestos abatement contractor in writing regarding defects in work under the guarantee.

1.11 OCCUPANCY OF SITE NOT EXCLUSIVE

Attention is specifically drawn to the fact that contractors, performing the work of other Contracts, may be brought upon any of the work sites of this Contract. Therefore, the asbestos abatement contractor shall not have exclusive rights to any site of his work and shall fully cooperate and coordinate his work with the work of other contractors who may be brought upon any site of the work of this Contract. This paragraph applies to those areas outside the regulated Work Area as defined by Title 15, Chapter I of RCNY.

1.12 SUBMITTALS

A. Pre-Construction Submittals:

1. Attend a pre-construction meeting scheduled by the City of New York Department of Design and Construction. This meeting shall also be attended by a designated representative of the City of New York third party air monitoring firm, facility manager and the Construction Project Manager. At this meeting, the asbestos abatement contractor shall present three copies of the following items:
   a. asbestos abatement contractor’s scope of work, work plan and schedule.

   b. Asbestos project notifications, approved variances and plans to Government Agencies.

   c. Copies of Permits, clearance and licenses if required.

   d. Schedules: the asbestos abatement contractor shall provide to the Construction Project Manager a copy of the following schedules for

approval. Once approved, schedules shall be maintained and updated as received. asbestos abatement contractor shall post a copy of all schedules at the site:

(1) A construction schedule stating critical dates of the project including, but not limited to, mobilization, Work Area preparation, demolition, gross removal, fine cleaning, encapsulation, inspections, clearance monitoring, and phase of refinishing and final inspections. The schedule shall be updated biweekly, at a minimum.

(2) A schedule of staffing stating number of workers per shift per activity, name and number of supervisor(s) per shift, shifts per day, and total days to be worked.

(3) Submit all changes in schedule or staffing to the Construction Project Manager prior to implementation.

e. Written description of emergency procedures to be followed in case of injury or fire. This section must include evacuation procedures, source of medical assistance (name and telephone number to nearest hospital) and procedures to be used for access by medical personnel (examples: first aid squad and physician). NOTE: Necessary Emergency Procedures Shall Take Priority Over All Other Requirements of These Specifications.

f. Safety Data Sheets (SDS) for encapsulants, sealants, firestopping foam, cleaners/disinfectants, spray adhesive and any and all potentially hazardous materials that may be employed on the project. No work involving the aforementioned will be allowed to proceed until SDS are reviewed.

g. Worker Training and Medical Surveillance: The asbestos abatement contractor shall submit a list of the persons who will be employed by him /her to perform the removal work. Present evidence that workers have received proper training required by the regulations and the medical examinations required by OSHA 29 CFR 1926.1101.

h. Logs: Specimen copies of daily progress log, visitor's log, and disposal log.

(1) The asbestos abatement contractor shall provide a permanently bound log book of minimum 8-1/2” x 11” size at the entrance to the Worker and Waste Decontamination enclosure system as hereinafter specified. Log book shall

contain on title page the project name, name, address and phone number of the asbestos abatement contractor; name, address and phone number of asbestos abatement contractor and City's third party air monitoring firm; emergency numbers including, but not limited to local Fire/Rescue Department. Log book shall contain a list of personnel approved for entry into the Work Area.

(2) All entries into the log shall be made in non-washable, permanent ink and such pen shall be strung to or otherwise attached to the log to prevent removal from the log-in area. Under no circumstances shall pencil entries be permitted. Any significant events occurring during the abatement project shall be entered into the log. Upon completion of the job, the asbestos abatement contractor shall submit the logbook containing a day-to-day record of personnel log entries countersigned by the Construction Project Manager every day.

i. Worker's Acknowledgments: Submit statements signed by each employee that the employee has received training in the proper handling of ACM, understands the health implications and risks involved; and understands the use and limitations of the respiratory equipment to be used.

B. During Construction Submittals:

1. Security and safety logs showing names of person entering workspace, date and time of entry and exit, record of any accident, emergency evacuation, and any other safety and/or health incident.

2. Progress logs showing the number of workers, supervisors, hours of work and tasks completed shall be submitted daily to the Construction Project Manager.

3. Floor plans indicating asbestos abatement contractor's current work progress shall be submitted for review by the Construction Project Manager.

4. All asbestos abatement contractors' air monitoring and inspection results.

C. Project Closeout Submittals:

Upon completion of the project and as a condition of acceptance, the asbestos abatement contractor shall present two copies of the following items, bound and indexed:

1. Lien Waivers from asbestos abatement contractor, sub-asbestos abatement contractors and Suppliers,

2. Daily OSHA air monitoring results,

3. All Waste Manifests (Asbestos and Construction Debris), seals and disposal logs,

4. Field Sign-In/Sign-Out Logs for every shift,

5. Copies of all Building Department Forms and Permits,

6. A Letter of Compliance stating that all the work on this project was performed in accordance with the Specifications and all applicable Federal, State and Local regulations,

7. All Warranties as stated in the Specifications,

    a. Fully executed disposal certificates and transportation manifest.

8. Project Record: The asbestos abatement contractor shall maintain a project record for all small and large asbestos projects. During the project, the project record shall be kept on site at all times. Upon completion of the project, the project record shall be maintained by the building owner. The project record shall be submitted to DDC as part of the close out documents. The project record shall consist of:

    a. Copies of licenses of all asbestos abatement contractors involved in the project;

    b. Copies of NYCDEP and NYSDOL supervisor and handler certificates for all workers engaged in the project;

    c. Copies of all project notifications and reports filed with NYCDEP, NYSDOL and USEPA for the project, with any amendments or variances;

    d. Copies of all asbestos abatement permits, including associated approved plans and work place safety plan;

    e. A copy of the air sampling log and all air sampling results;

    f. A copy of the abatement asbestos abatement contractor’s daily log book;

g. Copies of all asbestos waste manifests;

h. A copy of all Project Monitor's Reports (ACP-15).

i. A copy of each ATR-1 Form completed for the asbestos project (if required).

j. A copy of each Asbestos Project Conditional Closeout Report (ACP-20) if required.

k. A copy of the Asbestos Project Completion Form (ACP-21).

1.13 PROTECTION OF FURNITURE AND EQUIPMENT

Cover all furniture and equipment that cannot be removed from Work Areas. Movable furniture and equipment will be removed from Work Areas by the asbestos abatement contractor prior to start of work. At the conclusion of the work (after final air testing), the asbestos abatement contractor will remove all plastic covering on walls, floors, furniture, equipment and reinstall furniture and equipment. He shall remove and store all sheaths, curtains and drapes, and reinstall same following final clean up.

1.14 UTILITIES

A. General:

All temporary facilities shall be subject to the approval of the Commissioner. Prior to starting work at any site, locations and/or sketches (if required) of temporary facilities must be submitted to the Construction Project Manager for the required approval.

B. Water:

The Department of Design and Construction will furnish all water needed for construction, at no cost to the asbestos abatement contractor in buildings under their jurisdiction. However, it is the responsibility of the asbestos abatement contractor to ensure that hot water is provided for showering in the decontamination unit. The asbestos abatement contractor shall furnish, install and maintain any needed equipment to meet these requirements at his own expense.

C. Electricity:

The Department of Design and Construction will furnish all electricity needed for construction, at no cost to the asbestos abatement contractor in a building, under their jurisdiction. The asbestos abatement contractor is responsible for routing the electric power to the abatement Work Area.

All temporary lighting and temporary electrical service for Work Area shall be in weatherproof enclosures and be ground fault protected.

D. In leased spaces, arrangements for water supplies and electricity must be made with the landlord. However, all such arrangements must be made through and are subject to approval of the Department of Design and Construction. Utilities will be provided at no cost to the asbestos abatement contractor. However, it is the asbestos abatement contractor's (or the general contractor's) responsibility to furnish and install a suitable distribution system to the Work Area. This system will be provided at no cost to the City.

1.15 FEES

The asbestos abatement contractor shall be responsible for any and all fees or charges imposed by Local, State or Federal Law, Rule and Regulation applicable to the work specified herein, including fees or charges which may be imposed subsequent to the date of the Bid opening.

END OF SECTION

ASBESTOS ABATEMENT

PART 1 – GENERAL

1.01 DESCRIPTION

A. The Contract Documents are as defined in the "Agreement". The General Conditions shall apply to all Work of this Section.

B. Work specified herein shall be the removal and disposal of Asbestos-Containing Materials (ACM) and asbestos-contaminated materials from designated areas of the Astoria Branch Library ADA Renovation, 1401 Astoria Boulevard, Queens, NY 11102.

C. The following documents were reviewed and utilized to generate this abatement design specification which serves to locate and quantify the amount of ACM, and asbestos contaminated material, to be abated in support of this project.

1. Set of Issued for 100% Construction Documents Submission Drawings labeled "Astoria Branch Library Renovation", dated 04/29/22, prepared by Yoshihara McKee Architects, PC.

2. Asbestos survey performed by LiRo Engineers, Inc. titled "Limited Asbestos Survey Services, Astoria Branch Library Renovation" dated 12/12/19.

3. Asbestos survey performed by LiRo Engineers, Inc. titled "Final Report of Asbestos Survey Services, Astoria Community Library ADA Upgrade" dated 06/18/18.

D. The phasing and scheduling of work for this project shall be coordinated with and approved by the Construction Project Manager and Facility Manager. The Construction Project Manager and Facility Manager will make the final determination on all issues under this Contract covered by this Specification.

1.02 SCOPE OF WORK

A. The asbestos abatement contractor is to provide all labor, materials, equipment, services, testing, appurtenances, permits and agreements necessary to perform the work required for the abatement of ACM as required by these contract documents. All work shall be performed in accordance with this Specification, EPA regulations, OSHA regulations, New York City Local Law 70, Title 15, Chapter 1 RCNY, New York State Industrial Code 56, NIOSH recommendations, and any other applicable federal, state or local government regulations. Whenever there is a conflict or overlap of the above references, the most stringent provisions are applicable.

B. The intent of this Specification section is to ensure that the asbestos abatement contractor is responsible for the following:

1. Abatement of all ACM.

2. Cleaning and decontamination of the entire affected area.

3. Demolition that may be required to access ACM in each area, Asbestos abatement contractor shall dispose of all debris associated with demolition activities as ACM waste.

4. Removal and disposal of all ACM found within these areas such as wall plaster and ceiling plaster, etc.

5. Provide all scaffolding, platform installation, equipment, tools, transportation and any other equipment required and/or necessary to complete all work described in the Contract Documents.

6. The asbestos abatement contractor shall be responsible for and shall include any and all fees or changes imposed by Local, State or Federal Law, Rule or Regulation applicable to the work specified herein, including fees or charges which may be imposed subsequent to the work.

7. Prior to destructive demolition activities, the DDC may elect to collect bulk samples of assumed asbestos-containing materials and analyze the bulk samples for asbestos content.

C. The asbestos abatement contractor shall perform the following work as described below and indicated on the drawings. The drawings are only a diagrammatic representation of the Work Areas and do not constitute the actual quantities of material. Asbestos abatement contractor is responsible for the confirmation of the actual total quantities of the Work.

1. Drawing H002.00: Mezzanine Plan

a. Remove and dispose of asbestos-containing wall plaster 2nd layer (brown coat) & associated wall plaster 1st layer (white coat) and ceiling plaster 2nd layer (brown coat) & associated ceiling plaster 1st layer (white coat) within **Work Area 1**. Asbestos-containing wall plaster 2nd layer (brown coat) & associated wall plaster 1st layer (white coat) and ceiling plaster 2nd layer (brown coat) & associated ceiling plaster 1st layer (white coat) shall be removed utilizing NYCDEP 15, Chapter 1 §1-106 Tent Containment Procedures

Work Area	Removal Procedure	Approximate Square Feet (Sq. Ft.)	Approximate Linear Feet (Ln. Ft.)
1	NYCDEP 15, Chapter 1 Full Containment Procedures	560 Sq. Ft. of Wall Plaster 2nd Layer (Brown Coat) & Associated Wall Plaster 1st Layer (White Coat)	--
		550 Sq. Ft. of Ceiling Plaster 2nd Layer (Brown Coat) & Associated Ceiling Plaster 1st Layer (White Coat)	--

D. The facility is under the jurisdiction of the Queens Public Library. The asbestos abatement contractor shall perform the work of this contract in a manner that will be least disruptive to the normal use of the building.

E. Asbestos abatement contractor's attention is directed to the fact that patents cover certain methods of asbestos abatement indicated in the specifications. To date, patents have been issued with regard to negative pressure enclosures or negative or reduced pressure and glove-bag.

F. Asbestos abatement contractor shall be solely responsible for and shall hold the City of New York Department of Design and Construction and the City harmless from, any and all damages, losses and expenses resulting from any infringement by Asbestos abatement contractor of any patent, including but not limited to the patents described above, used by Asbestos abatement contractor during performance of this agreement.

G. Prior to starting, the asbestos abatement contractor must notify the Commissioner of the City of New York Department of Design and Construction if he anticipates any difficulty in performing the work as directed and required by these Specifications. Asbestos abatement contractor shall be required to attend an on-site job meeting with the Construction Project Manager prior to start of work to examine conditions of the site for removal and plan the sequence for removal operations.

H. The asbestos abatement contractor shall retain a certified Project Designer for the preparation of an Asbestos Variance Application (ACP-9), if required.

I. The asbestos abatement contractor shall be responsible for preparing and submitting all filings, notifications, amendments and variances, etc. required by all City, State and Federal regulatory agencies having jurisdiction, at no additional cost to the NYC DDC.

J. The general contractor shall retain a Registered Design Professional (person licensed and registered to practice the professions of architecture or engineering under the Education Law of the State of New York) to prepare a Work Place Safety Plan (WPSP), if required.

K. The general contractor shall retain a Registered Design Professional (person licensed and registered to practice the professions of architecture or engineering under the Education Law of the State of New York) to perform final inspections required pursuant to Title 28 of the Administrative Code, including but not limited to special inspections required under Chapter 17 of the Building Code. Such special inspections and A-TR1 forms shall be completed by the Registered Design professional.

L. For coordination with other Asbestos abatement contractors, see the General Conditions governing all Contracts.

M. Related Asbestos Removal Work Under Other Contracts:

1. Each asbestos abatement contractor shall be responsible for the removal of incidental asbestos not identified in this section and found prior to or during the Work.

2. Incidental asbestos is defined as ACM that is discovered during the course of their work that must be abated to enable them to perform the work of their Contract.

N. Work Hours:

1. The asbestos abatement contractor shall establish his work schedule in a way that avoids interference or conflict with the normal functioning of the facility. Work in the evenings shall be done at no additional cost to the City.

2. All work shall be done during regular working hours unless the Asbestos abatement contractor requests authorization to work other than regular working hours and such authorization is granted by the Commissioner (Regular working hours are those during which any given facility in which work is to be done is customarily open and functioning). If such work schedule is authorized by the Commissioner the work shall be done at no additional cost to the City.

3. The order of phases and start dates associated with each will be determined by the Construction Project Manager.

4. Asbestos abatement contractor shall be required to schedule waste transfer during evening hours, when activity within the facility is at a minimum. Evening hours are defined as 6:00 p.m. to 6:00 a.m. Waste transfer must be approved by the Construction Project Manager and Facility Manager.

O. The following conditions shall apply to all temporary shutdowns of existing services:

1. All temporary lighting and temporary electrical services for use in the Work Area shall be in weather proof enclosures and be ground fault protected and:

   a. Shall be performed at no additional charge to the City.

2. Shall be performed at times not interfering with the other activities in the building.

3. Shall be performed only with written consent from the Commissioner and the Facility Manager.

4. Shall be made through written request to the Commissioner at least 10 days in advance with complete written description of the work to be performed.

P. Stages of Asbestos Removal Work:

1. The asbestos abatement contractor will be required to perform the work and it is the intent of this Specification to remove all asbestos containing and asbestos contaminated materials from the Work Area. The asbestos abatement contractor is responsible for verifying all quantities of materials listed.

Q. Certain equipment in the Work Area may need to remain operational during removal. Therefore, the removal of ACM from this equipment shall be performed as the last removal activities within the Work Area. The Asbestos abatement contractor shall coordinate the scheduling for the removal of ACM on functioning equipment with the Construction Project Manager.

1.03 QUALIFICATIONS OF ASBESTOS ABATEMENT CONTRACTOR

A. Requirements: The asbestos abatement contractor must be approved through the Department's Request for Subcontractor Approval, administered by the Agency Chief Contracting Office (ACCO), Vendor Integrity Unit. The asbestos abatement contractor must demonstrate compliance with the special experience requirements set forth in subparagraphs (1) through (6) below. Such documentation shall include without limitation, all required licenses, certificates, and documentation.

1. The asbestos abatement contractor must, whether an individual, corporation, partnership, joint venture or other legal entity, demonstrate for the three year period prior to the work that it has been licensed by the New York State Department of Labor (NYSDOL), as an "Asbestos Abatement Contractor". The asbestos abatement contractor shall submit copies of the asbestos abatement contractors NYSDOL License for the past three years

2. The asbestos abatement contractor must, for the three-year period prior to the work, have been in the business of providing asbestos abatement services as a routine part of its daily operations.
3. The asbestos abatement contractor proposing to do asbestos abatement work must be thoroughly experienced in such work and must submit a list of five (5) asbestos abatement projects of similar size and complexity. The aggregate cost of these projects must be at least $1,000,000 in each of the three years.
4. For each project submitted to meet the experience requirements set forth above, the asbestos abatement contractor must submit the following information for the project; name and location of the project; name title and telephone number and email address of the owner or the owner's representative who is familiar with the asbestos abatement contractor's work; brief description of the scope of work completed as a prime or sub-asbestos abatement contractor; amount of contract or subcontract and the date of completion.
5. The asbestos abatement contractor must demonstrate that it has the financial resources, certified supervisory personnel and equipment necessary to carry out the work and to comply with the required performance schedule, taking into consideration other business commitments. The asbestos abatement contractor must submit such documentation as may be required by the Department of Design and Construction to demonstrate that it has the requisite capacity to perform the required services of this contract. The Department may also conduct an inspection of the asbestos abatement contractor's facility to verify if the contractor has equipment and staffing to perform the work.
6. The asbestos abatement contractor must submit a copy of their Corporate Health and Safety Plan for review and acceptance. A Job Hazard Analysis (JHA) for the specific work conducted must be included.

B. Throughout the specifications, reference is made to codes and standards which establish qualities and types of workmanship and materials, and which establish methods for testing and reporting on the pertinent characteristics thereof. Provide materials or workmanship that meet or exceed the specifically named codes or standards where required by these specifications.

C. Site Investigation: Asbestos abatement contractor shall inspect all the specifications and related drawings, and will investigate and confirm the site conditions affecting the work, including, but not limited to (1) through (5) below.
The asbestos abatement contractor will attend a walkthrough site inspection with the department's Project Manager and the Third-Party Air Monitor prior to the work. Such walkthrough will be scheduled at the Department's convenience.

1. Physical considerations and conditions of both the material and structure. These considerations include any obstacles or obstructions encountered in accessing or removing the material.

2. Handling, storage, transportation and disposal of the material.

3. Availability of qualified and skilled labor.

4. Availability of utilities.

5. Exact quantities of all materials to be disturbed and/or removed.

1.04 WORK BY OTHERS

The City reserves the right during the term of this Contract to have work performed on asbestos abatement projects by other asbestos abatement contractors as the situation warrants.

1.05 DEFINITIONS

A. General Explanation: Certain terms used in this Specification Section are defined below. Definitions and explanations of this Specification Section are not necessarily complete or exclusive, but are general for the Work to the extent they are not stated more explicitly in another element of the Contract Documents.

B. Definitions in General Use:

1. Approve: Where used in conjunction with Engineer's response to submittals, requests, applications, inquiries, reports and claims by Asbestos abatement contractor, the meaning of term "approved" will be held to limitations of Engineer's responsibilities and duties as specified in Contract Documents. In no case will "approval" by Engineer be interpreted as a release of Asbestos abatement contractor from responsibilities to fulfill requirements of Contract Documents.

2. Directed, Requested, etc.: Where not otherwise explained, terms such as "directed," "requested," "authorized," "selected," "approved," "required," "accepted," and "permitted" mean "directed by Engineer," "requested by Engineer," and similar phrases. However, no such implied meaning will be interpreted to extend Engineer's responsibility into Asbestos abatement contractor's responsibility for construction supervision.

3. Furnish: Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.

4. Indicated: The term "indicated" is a cross-reference to graphic representations, notes or schedules on Drawings, to other paragraphs or schedules in the Specifications, and to similar means of recording requirements in Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used in lieu of "indicated," it is for purpose of helping reader locate cross-reference, and no limitation of location is intended except as specifically noted.

5. Install: Except as otherwise defined in greater detail, term "install" is used to describe operations at Project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations, as applicable in each instance.

6. Installer: The term "installer" is defined as the entity (person or firm) engaged by the asbestos abatement contractor, or its sub-asbestos abatement contractor for performance of a particular unit of work at Project site, including installation, erection, application and similar required operations. It is a general requirement that such entities (installers) be expert in operations they are engaged to perform.

7. Provide: Except as otherwise defined in greater detail, term “provide” means furnish and install, complete and ready for intended use, as applicable in each instance.

8. Third-Party Air Monitor: The term “Third-Party Air Monitor ” is defined as an entity engaged by City and Construction Project Manager to perform specific inspections or tests of the work, either at Project site or elsewhere; and to report and (if required) interpret results of those inspections or tests.

C. Definitions Relative to Asbestos Abatement:

1. Abatement: Any and all procedures physically taken to control fiber release from asbestos-containing materials. This includes removal, encapsulation, enclosure, cleanup and repair.

2. Adequately Wet: The complete penetration of a material with amended water to prevent the release of particulates. If visible emissions are observed coming from asbestos-containing material, then the material has not been adequately wetted. However, the absence of visible emissions is not evidence of being adequately wet. ACM must be fully penetrated with the wetting

agent in order to be considered adequately wet. If the ACM being abated is resistant to amended water penetration, wetting agent shall be applied to the material prior to and during removal as necessary to minimize fiber release.

3. Aggressive Sampling: Method of sampling in which the individual collecting the air sample creates activity by the use of mechanical equipment during the sampling period to stir up settled dust and simulate activity in that area of the building.

4. AHERA: Asbestos Hazard Emergency Response Act of 1986

5. AIHA: American Industrial Hygiene Association.

6. Airlock: System for permitting entrance and exit while restricting air movement between a contaminated area and an uncontaminated area. It consists of two curtained doorways separated by a distance of at least three feet such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway, thereby preventing flow-through contamination.

7. Air Sampling: Process of measuring the fiber content of a known volume of air collected during a specific period. The procedure utilized for asbestos follows the NIOSH Standard Analytical Method 7400, or the provisional transmission electron microscopy methods developed by the US EPA which is utilized for lower detection levels and specific fiber identification.

8. Ambient Air Monitoring: “Ambient air monitoring” shall mean measurement or determination of airborne asbestos fiber concentrations outside but in the general vicinity of the worksite.

9. Amended Water: Water to which a surfactant has been added.

10. ANSI: American National Standards Institute

11. Area Air Sampling: Any form of air sampling or monitoring where the sampling device is placed at some stationary location.

12. Asbestos: Any hydrated mineral silicate separable into commercially usable fibers, including but not limited to chrysotile (serpentine), amosite (cumingtonite-grunerite), crocidolite (riebeckite), tremolite, anthophyllite and actinolite.

13. Asbestos-Containing Material (ACM): Asbestos or any material containing more than one-percent asbestos.

14. Asbestos-Containing Waste Material: ACM, asbestos-contaminated objects or debris associated with asbestos abatement requiring disposal.

15. Asbestos-Contaminated Objects: Any objects which have been contaminated by asbestos or asbestos-containing material.

16. Asbestos Assessment Report: "Asbestos Assessment Report" shall mean the "Form ACP-5" form, as approved by NYCDEP, by which a NYCDEP-certified asbestos investigator certifies that a building or structure (or portion thereof) is free of ACM or the amount of ACM to be abated constitutes a minor project.

17. Asbestos Handler: Individual who disturbs, removes, repairs, or encloses asbestos material. This individual shall have completed approved training course(s) and be in possession of certification issued by NYCDEP and NYSDOL.

18. Asbestos Handler Supervisor: Individual who supervises the handlers during an asbestos project and ensures that proper asbestos abatement procedures as well as individual safety procedures are being adhered to. This individual shall have completed approved training course(s) and be in possession of certification issued by NYCDEP and NYSDOL.

19. Asbestos Investigator: An individual certified by NYCDEP as having successfully demonstrated his or her ability to identify the presence of and evaluate the condition of asbestos in a building or structure.

20. Asbestos Project: Any form of work performed in a building or structure which will disturb (e.g., remove, enclose, encapsulate) asbestos-containing material.

21. ASTM: American Society for Testing and Materials.

22. Asbestos Project Notification: The "Form ACP-7" asbestos project notification form as approved by DEP.

23. Authorized Visitor: Authorized visitor shall mean the building owner and his/her representative, and any representative of a regulatory or other agency having jurisdiction over the project.

24. Building Owner: Person in whom legal title to the premises is vested unless the premises are held in land trust, in which instance Building Owner means the person in whom beneficial title is vested.

25. Building Materials: Any and all manmade materials, including but not limited to interior and exterior finishes, equipment, bricks, mortar, concrete, plaster, roofing, flooring, caulking, sealants, tiles, insulation, and outdoor paving such as sidewalks, paving tiles and asphalt.

26. Certified Industrial Hygienist (CIH): Individual with a minimum of five years experience as an industrial hygienist and who has successfully completed both levels of the examination administered by the American Board of Industrial Hygiene and who is currently certified by that board.

27. Certified Safety Professional (CSP): Individual having a bachelor's degree from an accredited college or university and a minimum of four years experience as a safety professional and who has successfully completed both levels of the examination administered by the Board of Certified Safety Professionals and who is currently certified by that board.

28. Chain of Custody: “Chain of Custody” shall mean the form or set of forms that document the collection and transfer of a sample.

29. City: City of New York

30. Clean Room: An uncontaminated area or room that is part of worker decontamination enclosure system with provisions for storage of workers' street clothes and protective equipment.

31. Clearance Air Monitoring: Employment of aggressive sampling techniques with a volume of air collected to determine the airborne concentration of residual fibers and shall be performed as the final abatement activity.

32. Commissioner: shall mean the head of the Agency that has entered into this contract or his/her duly authorized representative.

33. Competent Person: Shall mean the designated person as defined by OSHA in 29 CFR1926.1101.

34. Curtained Doorway: Device that consists of at least three overlapping sheets of fire retardant plastic over an existing or temporarily framed doorway. One sheet shall be secured at the top and left side, the second sheet at the top and right side, and the third sheet at the top and left side. All sheets shall have weights attached to the bottom to ensure that the sheets hang straight and maintain a seal over the doorway when not in use.

35. Decontamination Enclosure System: Series of connected rooms, separated from the Work Area and from each other by air locks, for the decontamination of workers, materials, waste containers, and equipment.

36. Demolition: The dismantling or razing of a building, including all operations incidental thereto (except for asbestos abatement activities), for which a demolition permit from the New York City Department of Buildings is required.

37. Department: shall mean the New York City Department of Design and Construction (DDC).

38. NYCDEP or DEP: The New York City Department of Environmental Protection.

39. Disturb: Any action taken which may alter, change, or stir, such as but not limited to the removal, encapsulation, enclosure or repair of asbestos-containing material.

40. DOB: The New York City Department of Buildings.

41. Egress: A continuous and unobstructed path of vertical and horizontal egress travel from any occupied portion of a building or structure to a public way. A means of egress consists of three separate and distinct parts: the exit access, the exit and the exit discharge.

42. ELAP: Environmental Laboratory Approval Program administered by the New York State Department of Health.

43. Encapsulant (sealant) or Encapsulating Agent: Liquid material which can be applied to ACM and which temporarily controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant). A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.

44. Encapsulation: The coating or spraying of asbestos-containing material encapsulant. A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.

45. Enclosure: Construction of airtight walls and/or ceilings between ACM and the facility environment, or around surfaces coated with ACM, or any other

appropriate procedure as determined by the NYCDEP which prevents the release of asbestos fibers.

46. EPA or USEPA: United States Environmental Protection Agency.

47. Equipment Room: Contaminated area or room that is part of the worker decontamination enclosure system with provisions for the storage of contaminated clothing and equipment.

48. Exit: That portion of a means of egress system which is separated from other interior spaces of a building or structure by fire-resistance-rated construction to provide a protected path of egress travel between the exit access and the exit discharge.

49. FDNY: The Fire Department of the City of New York.

50. Fiber: An acicular single crystal or a similarity elongated polycrystalline aggregate which displays some resemblance to organic fibers by having such properties as flexibility, high aspect ratio, silky luster, axial lineation, and others, and which has attained its shape primarily through growth rather than cleavage.

51. Fixed Object: A unit of equipment, furniture, or other item in the work area which cannot be removed from the work area. Fixed objects shall include equipment, furniture, or other items that are attached, in whole or in part, to a floor, ceiling, wall, or other building structure or system or to another fixed object and cannot be reasonably removed from the work area. Fixed objects shall also include pipes and other equipment inside the work area which are not the subject of the asbestos project. Active fire suppression system components shall not be considered fixed objects.

52. Glovebag technique: shall mean a method for removing asbestos-containing material from heating, ventilation and air conditioning (HVAC) ducts, short piping runs, valves, joints, elbows, and other nonplanar surfaces. The glovebag assembly is a manufactured device consisting of a large bag (constructed of at least 6-mil transparent plastic), two inward-projecting long sleeve gloves, one inward-projecting waterwand sleeve, an internal tool pouch, and an attached, labeled receptacle for asbestos waste. The glovebag is constructed and installed in such a manner that it surrounds the object or area to be decontaminated and contains all asbestos fibers released during the removal process.

53. HEPA-Filter: High efficiency particulate air filter capable of trapping and retaining 99.97 percent of particles (asbestos fibers) greater than 0.3 micrometers mass median aerodynamic equivalent diameter.

54. HEPA vacuum equipment: “HEPA vacuum equipment” shall mean vacuuming equipment with a HEPA filter.

55. Holding Area: Chamber in the equipment decontamination enclosure located between the washroom and an uncontaminated area.

56. Homogeneous Work Area: Portion of the Work Area that contains one type of ACM and/or where one type of abatement is used.

57. Industrial Hygiene: Science and art devoted to the recognition, evaluation, and control of those environmental factors or stresses, arising in or from the work place, which may cause sickness, impaired health and well being, or significant discomfort and inefficiency among worker or among the citizens of the community.

58. Industrial Hygienist: Individual having a college or university degree or degrees in Engineering, Chemistry, Physics or Medicine, or related Biological Sciences who, by virtue of special studies and training, has acquired competence in industrial hygiene. Such special studies and training must have been sufficient in all of the above cognate sciences to provide the abilities:

    a. To recognize the environmental factors and to understand their effect on people and their well being; and

    b. To evaluate, on the basis of experience and with the aid of quantitative measurement techniques, the magnitude of these stresses in terms of ability to impair people's health and well being; and

    c. To prescribe methods to eliminate, control, or reduce such stresses when necessary to alleviate their efforts.

59. Isolation Barrier: The construction of partitions, the placement of solid materials, and the plasticizing of apertures to seal off the work place from surrounding areas and to contain asbestos fibers in the work area.

60. Large Asbestos Project: Asbestos project involving the disturbances (e.g., removal, enclosure, encapsulation) of 260 linear feet or more of ACM or 160 square feet or more of ACM.

61. Log: An official record of all activities that occurred during the project. At a minimum, the log shall identify the building owner, agent, asbestos abatement contractor, and workers, and other pertinent information including daily activities, cleanings and waste transfers, names and certificate numbers of asbestos handler supervisors and asbestos handlers; results of inspections of decontamination systems, barriers, and negative pressure ventilation equipment; summary of corrective actions and repairs; work stoppages with reason for stoppage; manometer readings at least twice per work shift; daily checks of emergency and fire exits and any unusual events.

62. Minor Project: A project involving the disturbance (e.g., removal, enclosure, encapsulation, repair) of 25 linear feet or less of asbestos containing material or 10 square feet or less of asbestos containing material.

63. Movable Object: Unit of equipment or furniture in the Work Area that can be removed from the Work Area.

64. Negative Air Pressure Equipment: Portable local exhaust system equipped with HEPA filtration. The system shall be capable of creating a negative pressure differential between the outside and inside of the Work Area.

65. NESHAPS: National Emission Standards for Hazardous Air Pollutants.

66. NFPA: The National Fire Protection Association.

67. NIOSH: National Institute for Occupational Safety and Health.

68. DEP or NYCDEP: New York City Department of Environmental Protection

69. NYSDOL: New York State Department of Labor.

70. NYSDOL ICR 56: “NYSDOL ICR 56” shall mean Part 56 of the Official Compilation of Codes, Rules and Regulations of the State of New York or 12 NYCRR Part 56.

71. NYSDOH: The New York State Department of Health.

72. Obstruction: The blocking of a means of egress with any temporary structure or barrier. A double layer of fire-retardant 6-mil polyethylene sheeting shall not be considered an obstruction when it is prominently marked as an exit with photo luminescent signage or paint and cutting tools (knife, razor) are attached to the work area side of the sheeting for use in the event that the sheeting must be cut to permit egress. A corridor shall not be considered obstructed when there is a clear path measuring at least three (3) feet wide.

73. Occupied Area: Area of the work site where abatement is not taking place and where personnel or occupants normally function or where workers are not required to use personal protective equipment.

74. OSHA: Occupational Safety and Health Administration.

75. Outside air: “Outside air” shall mean the air outside the work place.

76. Person: Individual, partnership, company, corporation, association, firm, organization, governmental agency, administration, or department, or any other group of individuals, or any officer or employee thereof.

77. Personal Air Monitoring: Method used to determine employees' exposure to airborne asbestos fibers. The sample is collected outside the respirator in the worker's breathing zone.

78. Personal Protective Equipment (PPE): Appropriate protective clothing, gloves, eye protection, footwear, and head gear.

79. Phase Contrast Microscopy (PCM): The measurement protocol for the assessment of the fiber content of air. (NIOSH Method 7400).

80. Physician: Person licensed or otherwise authorized under Article 131 Section 65.22 of the New York State Education Law.

81. Plasticize: To cover floors and walls with fire retardant plastic sheeting as herein specified or by using spray plastics as acceptable to the Department.

82. Polarized Light Microscopy (PLM): The measurement protocol for the assessment of the asbestos content of bulk materials. (Interim Method for the Determination of Asbestiform Materials in Bulk Insulation Samples- 40 CFR Part 763, Subpart F, Appendix A as amended on September 1, 1982)

83. Project Designer: A person who holds a valid Project Designer Certificate issued by the New York State Department of Labor.

84. Project Monitor: A person who holds a valid Project Monitor Certificate issued by the New York State Department of Labor.

85. Qualitative Fit Test: Individual test subject's responding (either voluntarily or involuntarily) to a chemical challenge outside the respirator face-piece. Acceptable methods include irritant smoke test, odorous vapor test, and taste test.

86. Quantitative Fit Test: Exposing the respiratory wearer to a test atmosphere containing an easily detectable, nontoxic aerosol, vapor or gas as the test agent. Instrumentation, which samples the test atmosphere and the air inside the face-piece of the respirator, is used to measure quantitatively the leakage into the respirator. There are a number of test atmospheres, test agents, and exercises to perform during the test.

87. Registered Design Professional: A person licensed and registered to practice the professions of architecture or engineering under the Education Law of the State of New York.

88. Removal: Stripping of any asbestos- containing materials from surfaces or components of a facility or taking out structural components in accordance with 40 CFR 61 Subparts A and M.

89. Renovation: An addition or alteration or change or modification of a building or the service equipment thereof, that is not classified as an ordinary repair as defined in §27-125 of the Administrative Code of the City of New York.

90. Repair: Corrective action using specified work practices (e.g., glovebag, plastic tent procedures, etc.) to minimize the likelihood of fiber release from minimally damaged areas of ACM.

91. Replacement material: Any material used to replace ACM that contains less than .01 percent asbestos.

92. Shift: A worker's, or simultaneous group of workers', complete daily term of work.

93. Shower Room: Room between the clean room and the equipment room in the worker decontamination enclosure with hot and cold running water controllable at the tap and arranged for complete showering during decontamination.

94. Small Asbestos Project: Asbestos project involving the disturbance (e.g., removal, enclosure, encapsulation) of more than 25 and less than 260 linear feet of ACM or more than ten and less than 160 square feet of ACM.

95. Staging Area: Work Area near the waste transfer airlock where containerized asbestos waste has been placed prior to removal from the Work Area.

96. Strip: To remove asbestos materials from any part of the facility.

97. Structural Member: Load-supporting member of a facility, such as beams and load-supporting walls, or any non-load-supporting member, such as ceiling and non-load-supporting walls.

98. Surface barriers: The plasticizing of walls, floors, and fixed objects within the work area to prevent contamination from subsequent work.

99. Surfactant: Chemical wetting agent added to water to improve penetration.

100. Transmission Electron Microscopy (TEM): The measurement protocol for the assessment of the asbestos fiber content of air. Interim Transmission Electron Microscopy Analytical Methods-40 CFR Part 763, Subpart E, Appendix A.

101. Visible Emissions: Emissions containing particulate material that are visually detectable without the aid of instruments.

102. Washroom: Room between the Work Area and the holding area in the equipment decontamination enclosure system where equipment and waste containers are wet cleaned and/or HEPA-vacuumed prior to disposal.

103. Waste decontamination enclosure system: “Waste decontamination enclosure system” shall mean the decontamination enclosure system designated for the controlled transfer of materials and equipment, consisting of a washroom and a holding area.

104. Wet Cleaning: “Wet cleaning” shall mean the removal of asbestos fibers from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with water.

105. Wet methods: “Wet methods” shall mean the use of amended water or removal encapsulants to minimize the generation of fibers during ACM disturbance.

106. Work Area: Designated rooms, spaces, or areas of the building or structure where asbestos abatement activities take(s) place.

107. Worker Decontamination Enclosure System: Portion of a decontamination enclosure system designed for controlled passage of workers and authorized visitors, consisting of a clean room, a shower room, and an equipment room separated from each other and from the Work Area by airlocks and curtained doorways.

108. Work Place: The work area and the decontamination enclosure system(s).

109. Work Place Safety Plan: Construction documents prepared by a registered design professional and submitted for review by DEP in order to obtain an asbestos abatement permit. Such plan shall include, but not be limited to, plans, sections, and details of the work area clearly showing the extent, sequence, and means and methods by which the work is to be performed.

110. Work Site: Premises where abatement activity is being performed. May be composed of one or more Work Areas.

1.06 STANDARD OPERATING PROCEDURES

A. Develop and implement a written standard procedure for abatement work to ensure maximum protection and safeguard from asbestos exposure of the workers, visitors, employees, public, and environment.

B. TELEPHONE DEVICE

The asbestos abatement contractor or his authorized representative shall, at all times during the normal workday or during periods of overtime work under this Contract, carry a mobile cellular telephone capable of transmitting photographs and data. He/she shall supply the Department of Design and Construction with the phone number for the device and he/she is liable to respond back to the calls from DDC within the next one (1) hour period after he/she receives calls from DDC. The cost to the asbestos abatement contractor for this device and all charges accruing thereto is deemed included in the work.

C. The standard operating procedure shall ensure:

1. Tight security from unauthorized entry into the workspace.

2. Restriction of asbestos abatement contractor's personnel to the immediate Work Area and access/egress routes.

3. Donning of proper protective clothing and respiratory protection prior to entering the Work Area.

4. Safe work practices in the work place, including provisions for inter-room communications, exclusion of eating, drinking, smoking, or in any way breaking the respiratory protection.

5. Proper exit practices from the work space to the outside through the showering and decontamination facilities.

6. Removing asbestos in a way that minimizes release of fibers.

7. Packing, labeling, loading, transporting, and disposing of contaminated material in a way that minimizes exposure and contamination.

8. Emergency evacuation procedures, for medical or safety situations, to minimize the potential exposure to airborne asbestos fibers for emergency personnel, building occupants, and building environment.

9. Safety from accidents in the workspace, especially from electrical shocks, fall hazards associated with scaffolding, slippery surfaces, and entanglements in loose hoses and equipment.

10. Provisions for effective supervision, air monitoring and personnel monitoring for exposure during the work.

11. Engineering controls that minimize exposure to fibers within the workspace.

12. The asbestos abatement contractor shall provide a 24-hour fire watch throughout the entire term of the project, to protect against fire and unauthorized entry into the workspace when required by the NYCDEP. Fire watch shall be performed by an individual who is a certified asbestos worker capable of entering the Work Area for regular inspections.

D. Provide an Asbestos Handler Supervisor to provide continuous supervision of all work, and to be responsible for the following:

1. Ensure that individuals are using proper personal protective equipment, are trained in its use and hold valid NYCDEP and NYSDOL Asbestos Handler certificates.

2. Maintain entry log records and ensure that they are recorded in accordance with the provisions of Title 15, Chapter 1 of RCNY and NYSDOL ICR 56.

3. Surveillance of the Work Areas at a minimum of once per work shift or as required by Title 15, Chapter 1 of RCNY and NYSDOL ICR 56 -7.3, to ensure the integrity of work place isolation, negative pressure equipment and workers personal protective equipment is not torn or ripped and that respiratory protection is worn at all times.

4. Ensure that sufficient personal protective equipment is stored in the clean room.

5. Take precautions to prevent heat stress. Precautions include, but are not limited to, selecting lightweight protective clothing, reducing the work rate, and providing adequate fluid breaks.

6. Perform work area inspection with project monitor prior to the commencement of final clearance air monitoring.

7. The asbestos abatement contractor shall retain the asbestos handler supervisor to perform a visual inspection prior to the post-abatement clearance air monitoring to confirm that all containerized waste has been removed from work and holding areas and there is no visible ACM debris or residue on or about all abated surfaces.

E. ENGINEERING CONTROLS

1. All asbestos projects shall utilize negative pressure ventilation equipment.

   a. The asbestos abatement contractor shall use a manometer to document the pressure differential. The asbestos abatement contractor shall install and make the manometer operational once the negative pressure has been established in the work area. Magnahelic manometers shall be calibrated at least every six months and a copy of the current calibration certification shall be available at the work site.

2. Negative pressure ventilation equipment shall be installed and operated to provide at least one air change in the work area every 15 minutes. Where there are no floor or wall barriers because floor or wall material is being abated, there shall be at least one air change in the work area every ten minutes.

3. The negative pressure ventilation equipment shall operate continuously, 24 hours a day, from the establishment of isolation barriers through successful clearance air monitoring. If such equipment shuts off, adjacent areas shall be monitored for asbestos fibers.

4. A static negative air pressure of 0.02 inches (minimum) water column shall be maintained at all times in the work place during abatement to ensure that contaminated air in the Work Area does not filter back to uncontaminated areas.

5. If the contaminated area of an asbestos project covers the entire floor of the affected building, or an area greater than 15,000 square feet on any given floor, the installation of a negative air cut off switch or switches shall be required at a single location outside the work place, such as inside a stairwell, or at a secured location in the ground floor lobby when conditions warrant. The required switch or switches shall be installed by a licensed electrician pursuant to a permit issued by the Department of Buildings. If negative

pressure ventilation equipment is used on multiple floors, the cut off switch shall be able to turn off the equipment on all floors.

6. On loss of negative pressure or electric power to the negative pressure ventilating units, abatement shall stop immediately and shall not resume until power is restored and negative pressure ventilation equipment is operating again.

7. Negative pressure ventilation equipment shall be exhausted to the outside of the building away from occupied areas.

   a. All openings (including but not limited to operable windows, doors, vents, air intakes or exhausts of any mechanical devices) less than 15 feet from the exterior exhaust duct termination location shall be plasticized with two layers of fire retardant 6-mil polyethylene sheeting, or a second negative pressure ventilation unit with the primary unit's capacity shall be connected in series prior to exhausting to the outside.

   b. Negative pressure ventilation equipment shall exhaust away from areas accessible to the public.

   c. All ducting shall be sealed and braced or supported to maintain airtight joints. Ducts shall be reinforced and shall be installed so as to prevent breakage. Damage to ducts must be repaired immediately.

8. Where ducting to the outside is not possible, a second negative pressure ventilation unit compatible with the primary unit's capacity shall be connected in series. The area receiving the exhaust shall have sufficient, non-recycling exhaust capacity to the outside of the structure.

9. In the event that there is a failure of the containment system or a breach in the Isolation Barriers, all abatement work will cease and the asbestos abatement contractor will immediately correct the condition. Abatement work will not resume until the Work Area has been smoke tested by the third party laboratory and approved by the Construction Project Manager.

F. LOCKDOWN ENCAPSULATION PROCEDURES

1. The following procedures shall be followed to seal in non-visible residue while conducting lockdown encapsulation on all surfaces from which ACM has not been removed:

   a. Only encapsulants rated as acceptable or marginally acceptable on the basis of Battelle Columbus Laboratory test procedures and rating

requirements developed under the 1978 USEPA Contract shall be used for lockdown encapsulation.

b. The encapsulant solvent or vehicle shall not contain a volatile hydrocarbon unless reviewed and approved by DEP.

c. Latex paint with solids content greater than 15 percent shall be considered a lockdown sealant for coating all non-metallic surfaces.

d. Encapsulants shall be applied using airless spray equipment. Spraying is to occur at the lowest pressure range possible to minimize fiber release from encapsulant impact at the surface. It shall be applied with a consistent horizontal or vertical motion.

e. The cleaned layer of the surface barriers shall be removed from walls and floors.

The isolation barriers shall remain in place throughout cleanup. Decontamination enclosure systems shall remain in place and be utilized. A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.

1.07 NOTIFICATIONS, PERMITS, WARNING SIGNS, LABELS, AND POSTERS

A. The asbestos abatement contractor shall submit an Asbestos Project Notification (ACP-7) to the NYCDEP listing each work area within the building separately one week in advance of the start of work.

B. The registered design professional shall obtain an asbestos abatement permit authorizing the performance of construction work as required for asbestos projects involving one or more of the following activities:

1. Obstruction of an exit door leading to an exit stair or the exterior of the building;

2. Obstruction of an exterior fire escape or access to that fire escape;

3. Obstruction of a fire-rated corridor leading to an exit door;

4. Removal of handrails in an exit stair or ramp;

5. Removal or dismantling of any fire alarm system component including any fire alarm-initiating device (e.g., smoke detectors, manual pull station);

6. Removal or dismantling of any exit sign or any component of the exit lighting system, including photo luminescent exit path markings;

7. Removal or dismantling of any part of a sprinkler system including piping or sprinkler heads;

8. Removal or dismantling of any part of a standpipe system including fire pumps or valves;

9. Removal of any non-load bearing / non-fire-rated wall (greater than 45 square feet or 50 percent of a given wall);

10. Any plumbing work other than the repair or replacement of plumbing fixtures;

11. Removal of any fire-resistance rated portions of a wall, ceiling, floor, door, corridor, partition, or structural element enclosure including spray-on fire resistance rated materials;

12. Removal of any fire damper, smoke damper, fire stopping material, fire blocking, or draft stopping within fire-resistance rated assemblies or within concealed spaces;

13. Any work that otherwise requires a permit from the DOB (full demolitions, alterations, renovations, modifications or plumbing work).

C. The asbestos abatement contractor shall provide a floor plan showing the areas of the building under abatement and the location of all fire exits in said areas. It shall be prominently posted in the building lobby or comparable location, along with a notice stating the location within the building of the negative air cutoff switch, if applicable.

D. When one or more of the activities listed in 1.07 (B) (1-8) and (B)(13) of this specification an asbestos abatement permit is required by DEP. The general contractor is responsible for submitting, a work place safety plan (WPSP) and any other applicable construction documents. These documents must be prepared and sealed by a registered design professional.

E. A WPSP is not required for projects requiring an asbestos abatement permit due to one or more of the activities listed in 1.07 (B) (9-12) of this specification. The asbestos abatement contractor shall submit, together with the asbestos project notification, all applicable asbestos abatement permit construction documents.

F. The general contractor shall retain a Registered Design Professional to perform the inspections required pursuant to Title 28 of the Administrative Code, including but not limited to special inspections required by Chapter 17 of the Building Code, as follows:

1. A final inspection shall be performed by a registered design professional retained by the general contractor after all work authorized by the asbestos abatement permit is completed. The person performing the inspection shall note all failures to comply with the provisions of the Building Code or approved asbestos abatement permit and shall promptly notify the owner in writing. All defects noted in such inspection shall be corrected. The final inspection report shall either:

a. Confirm:

(1) That the construction work is complete, including the reinstallation or reactivation of any building fire safety or life safety component.

(2) That any defects previously noted have been corrected.

(3) That all required inspections were performed.

(4) That the work is in substantial compliance with the approved asbestos abatement permit construction documents, the Building Code, and other applicable laws and rules.

b. Confirm:

(1) That the construction work does not return the building (or portion thereof) affected by the abatement project to a condition compliant with the building code and other applicable laws and rules, but that the registered design professional has reviewed an application for asbestos abatement permit construction documents approval that has been approved by the department of buildings, and the subsequent scope of work as approved will, upon completion, render all areas affected by the asbestos project in full compliance with the building code and all applicable laws and rules.

(2) That any defects previously noted that are not addressed by the subsequent scope of work as approved by the department of buildings, have been corrected.

(3) That all required inspections that are not addressed by the subsequent scope of work as approved by the department of buildings were performed.

(4) That all completed work pursuant to an asbestos abatement permit is in substantial compliance with the approved asbestos abatement permit construction documents.

G. The Registered Design Professional shall provide the final inspection reports to be filed with DEP on A-TR1 form. Records of final inspections made by registered design professionals shall be submitted to DDC as part of the close out document package.

H. Erect bilingual (English-Spanish) warning signs around the work space and at every point of potential entry from the outside and at main entrance to building which can be viewed by the public without obstruction, in accordance with OSHA 29 CFR 1926.1101 (K) (Sign Specifications) and Title 15, Chapter 1 of RCNY. The warning signs shall be a bright color so that they will be easily noticeable. The size of the sign and the size of the lettering shall be no less than OSHA requirements.

I. Provide the required labels for all polyethylene bags and all drums utilized to transport contaminated material to the landfill in accordance with OSHA 29 CFR 1926.1101 (K)(2) and by 49 CFR Parts 171 and 172 of the Department of Transportation regulations.

J. Provide any other signs, labels, warnings, and posted instructions that are necessary to protect, inform and warn people of the hazard from asbestos exposure. Post in a prominent and convenient place for the workers a copy of the latest applicable regulations from OSHA, EPA, NIOSH, State of New York and New York City and any additional items mandated for posting by the aforementioned regulations.

K. Furnish all permits, variances and notices required to perform the Work.

1.08 EMERGENCY PRECAUTIONS

A. Establish emergency and fire exits from the Work Area. The clean side of all emergency exits shall be equipped with two full sets of protective clothing and respirators at all times.

B. Notify local medical emergency personnel, both ambulance crews and hospital emergency room staff prior to commencement of abatement operations as to the possibility of having to handle contaminated or injured workmen.

C. Prepare to administer first aid to injured personnel after decontamination. Seriously injured personnel shall be treated immediately or evacuated immediately for decontamination. When an injury occurs, precautions shall be taken to reduce airborne fiber concentrations (i.e., misting of the air with water) until the injured person has been removed from the Work Area.

D. Notify, before actual removal of the asbestos material, the local police and fire departments to the danger of entering the Work Area. Asbestos abatement contractor shall make every effort to help these agencies form plans of action should their personnel need to enter the contaminated area.

1.09 SUBMITTALS

A. Pre-Construction Submittals:

1. Attend a pre-construction meeting scheduled by the Department. This meeting shall also be attended by a designated representative of the City of New York third party air monitoring firm, facility manager and the Construction Project Manager. At this meeting, the asbestos abatement contractor shall present three copies of the following items, bound and indexed. The detailed plan of action must be submitted at least five (5) days prior to the pre-construction meeting.

a. Asbestos abatement contractor's scope of work, work plan and schedule.

b. Asbestos project notifications, approved variances and plans to Government Agencies.

c. Copies of Permits, clearance and licenses if required.

d. Schedules: the asbestos abatement contractor shall provide to the Construction Project Manager a copy of the following schedules for approval. Once approved, schedules shall be maintained and updated as received. Asbestos abatement contractor shall post a copy of all schedules at the site:

(1) A construction schedule stating critical dates of the project including, but not limited to, mobilization, Work Area preparation, demolition, gross removal, fine cleaning, encapsulation, inspections, clearance monitoring, and phase of refinishing and final inspections. The schedule shall be updated biweekly, at a minimum.

(2) A schedule of staffing stating number of workers per shift per activity, name and number of supervisor(s) per shift, shifts per day, and total days to be worked.

(3) Submit all changes in schedule or staffing to the Construction Project Manager prior to implementation.

(4) A schedule of equipment to be used including numbers and types of all major equipment such as HEPA Air Filtration Units, HEPA-vacuums, airless sprayers, Water Atomizing Devices and Type "C" compressors.

e. A written plan and shop drawings for preparation of work site and decontamination chamber.

f. Description of protective clothing and approved respirator to be used, make, model, NIOSH approval numbers.

g. Delineation of responsibility of work site supervision, including competent person, with names, resumes, and home telephone numbers.

h. Explanation of decontamination sequence and isolation techniques.

i. Description of specific equipment to be utilized, including make and model number of air filtration devices, vacuums, sprayers, etc.

j. Description of any prepared methods, procedures, techniques, or equipment other than those specified in the Contract Documents.

k. Explanation of the handling of asbestos contaminated wastes including EPA and NYCDEC identification numbers of Waste Hauler.

l. Description of the final clean-up procedures to be used.

m. Name and qualifications of asbestos abatement contractor's Air Monitor including AIHA accreditation, and proof of NIOSH PAT and NIST/NVLAP Bulk Quality Assurance Proficiency of OSHA samples for approval by the City of New York Department of Design and Construction.

n. Written description of emergency procedures to be followed in case of injury or fire. This section must include evacuation procedures, source of medical assistance (name and telephone number) and

procedures to be used for access by medical personnel (examples: first aid squad and physician). NOTE: Necessary Emergency Procedures Shall Take Priority Over All Other Requirements of These Specifications.

o. Safety Data Sheets (SDS) for encapsulants, sealants, firestopping foam, cleaners/disinfectants, spray adhesive and any and all potentially hazardous materials that may be employed on the project. No work involving the aforementioned will be allowed to proceed until SDS are reviewed.

p. Worker Training and Medical Surveillance: Asbestos abatement contractor shall submit a list of the NYSDOL and NYCDEP Asbestos supervisors and handlers who will work on this project. Present evidence that workers have received proper training required by the regulations and required by OSHA 29 CFR 1926.1101 (Asbestos Standard) and 1926.1200 (HAZCOM standard) and any other standards applicable to the work.

q. Logs: Specimen copies of daily progress log, visitor's log, and disposal log.

(1) The asbestos abatement contractor shall provide a permanently bound log book of minimum 8-1/2” x 11” size at the entrance to the Worker and Waste Decontamination enclosure system as hereinafter specified. Log book shall contain all information specified in ICR56-3.4 (a)(2)(i).

(2) All entries into the log shall be made in non-washable, permanent ink and such pen shall be strung to or otherwise attached to the log to prevent removal from the log-in area. Under no circumstances shall pencil entries be permitted. Any significant events occurring during the abatement project shall be entered into the log. Upon completion of the job, the Asbestos abatement contractor shall submit a copy of the logbook containing a day-to-day record of personnel log entries countersigned by the Construction Project Manager every day.

(3) Worker's Acknowledgments: Submit statements signed by each employee that the employee has received training in the proper handling of ACM, understands the health implications and risks involved; and understands the use and limitations of the respiratory equipment to be used.

B. During Construction Submittals:
Submit copies of the following items to the Construction Project Manager during the work:

1. Security and safety logs showing names of person entering workspace, date and time of entry and exit, record of any accident, emergency evacuation, and any other safety and/or health incident.

2. Progress logs showing the number of workers, supervisors, hours of work and tasks completed shall be submitted daily to the Construction Project Manager.

3. Floor plans indicating asbestos abatement contractor's current work progress shall be submitted for review by the Construction Project Manager at weekly progress meetings.

4. All asbestos abatement contractors' air monitoring and inspection results.

C. Project Closeout Submittals:

Upon completion of the project and as a condition of acceptance, the asbestos abatement contractor shall present two copies of the following items, bound and indexed:

1. Lien Waivers from asbestos abatement contractor, Sub-asbestos abatement contractors and Suppliers,

2. Daily OSHA air monitoring results,

3. All Waste Manifests (Asbestos and Construction Debris), seals and disposal logs,

4. Field Sign-In/Sign-Out Logs for every shift,

5. Copies of all Building Department Forms and Permits,

6. A Letter of Compliance stating that all the work on this project was performed in accordance with the Specifications and all applicable Federal, State and Local regulations,

7. All Warranties as stated in the Specifications,

    a. Fully executed disposal certificates and transportation manifest.

8. Project Record: The asbestos abatement contractor shall maintain a project record for all small and large asbestos projects. During the project, the project record shall be kept on site at all times. Upon completion of the

project, the project record shall be maintained by the building owner. The project record shall consist of:

a. Copies of licenses of all asbestos abatement contractors involved in the project;

b. Copies of DEP and NYSDOL supervisor and handler certificates for all workers engaged in the project;

c. Copies of all project notifications and reports filed with DEP, NYSDOL and EPA for the project, with any amendments or variances;

d. Copies of all asbestos abatement permits, including associated approved plans and work place safety plan;

e. A copy of the air sampling log and all air sampling results;

f. A copy of the abatement asbestos abatement contractor's daily log book;

g. All data related to bulk sampling including the results of any asbestos surveys performed by an asbestos investigator;

h. Copies of all asbestos waste manifests;

i. A copy of all Project Monitor's Reports (ACP-15).

j. A copy of each ATR-1 Form completed for the asbestos project (if required).

k. A copy of each Asbestos Project Conditional Closeout Report (ACP-20).

l. A copy of the Asbestos Project Completion Form (ACP-21).

m. A copy of the project record shall be submitted to DDC and its Third Party Air Monitor within 48 hours of the Issuance of the ACP-21 form, as part of the close out documents.

9. The asbestos abatement contractor shall submit one of the following certifications to the general contractor, with a copy provided to DDC:

a. Asbestos Project Completion Form. If an asbestos project has been performed, a copy of the asbestos project completion form issued by

DEP shall be submitted to DOB, with a copy being provided to DDC, prior to the issuance of a DOB permit and to any amendment of the underlying construction document approval which increases the scope of the project to include (a) work area(s) not previously covered.

b. An Asbestos Project Conditional Close-out Form. If an asbestos project has been performed a copy of the asbestos project conditional close-out form issued by DEP shall be submitted to DOB, with a copy being provided to DDC, prior to the issuance of a DOB permit and to any amendment of the underlying construction document approval which increases the scope of the project to include (a) work area(s) not previously covered.

1.10 QUALITY ASSURANCE

A. All work required for the completion of this project or called for in this Specification must be executed in a workmanlike manner by using the appropriate methods established by regulatory requirements and/or industrial standards. All workmanship or work methods are subject to review and acceptance by the Construction Project Manager. Throughout the Specification, reference is made to codes and standards which establish qualities, levels or types of workmanship which will be considered acceptable. It is the asbestos abatement contractor's responsibility to comply with these codes and standards during the execution of this work.

B. All materials and equipment required or consumed during the work of this Contract must meet the minimum acceptable criteria established by codes and standards referenced elsewhere in this Specification. Materials and equipment must be submitted for prior approval to the DDC project manager as part of the asbestos abatement contractor's "Shop Drawings".

C. It is the asbestos abatement contractor's responsibility, when so required by the Specification or upon written request from the Commissioner or his representative to furnish all required proof that workmanship, materials and/or equipment meet or exceed the codes and standards referenced. Such proof shall be in the form requested, typically a certified report or test conducted by a testing entity approved for that purpose by DDC.

D. The asbestos abatement contractor shall furnish proof that employees working under his supervision have had instruction on the dangers of asbestos exposure, on respirator use, decontamination, and OSHA regulations. This proof shall be in the form of a notarized affidavit to the effect that the above requirements have been satisfied and a copy of the Job Hazard Analysis (JHA) with tool box meeting executed meeting sign in sheet.

E. The asbestos abatement contractor will have posted and in view at the job site the OSHA regulations 29 CFR 1910.1001, and 1926.1101 Asbestos Standard, and 29 CFR 1926.59 Hazard Communication Standard Environmental Protection Agency 40 CFR, Part 61, subpart B: National Emission Standard for asbestos, asbestos stripping, work practices and disposal of asbestos waste. One copy of NYC Title 15, Chapter 1 of RCNY and NYS DOL ICR 56 at the job site at all times.

F. Familiarity with Pertinent Codes and Standards: In procuring all items used in this work, it is the asbestos abatement contractor's responsibility to verify the detailed requirements of the specifically named codes and standards and to verify that the items procured for use in this work meet or exceed the specified requirements, and are suitable for their intended use.

G. Rejection of Non-Complying Items: The Commissioner reserves the right to reject items incorporated into the work that fail to meet the specified minimum requirements. The Commissioner further reserves the right, and without prejudice to other recourse that maybe taken, to accept non-complying items subject to an adjustment in the Contract amount as approved by the City.

H. Applicable Regulations, Codes and Standards: Applicable standards listed in these Specifications include, but are not necessarily limited to, standards promulgated by the following agencies and organizations:

1. American National Standards Institute (ANSI)
   (Successor to USASI and ASA)
   25 West 43rd Street (between 5th and 6th Avenue) 4th Floor
   New York, NY 10036
   212-642-4900

2. American Society for Testing and Materials (ASTM)
   100 Bar Harbor Drive
   West Conshohocken, PA 19428-2959
   610-832-9500

3. National Institute for Occupational Safety and Health (NIOSH)
   Robert A. Taft Laboratory
   4676 Columbia Pkwy
   Mailstop R12 Cincinnati, Ohio 45226
   513-841-4428

4. National Electrical Code (NEC)
   See NFPA

5. National Fire Protection Association (NFPA)

1 Batterymarch Park
Quincy, Massachusetts 02169-7471
617-770-3000

6. New York City Fire Department (FDNY)
9 Metrotech Center
Brooklyn, NY 11201-5431
718-999-2117

7. New York City Department of Buildings (NYC DOB)
Enforcement Division
280 Broadway, New York, New York 10007
212- 566-2850

8. New York City Department of Environmental Protection (NYCDEP)
Bureau of Environmental Compliance
Asbestos Control Program
59-17 Junction Boulevard, 8th Floor
Corona, New York 11368
718-595-3682

9. New York City Department of Health and Mental Hygiene (NYC DOHMH)
Environmental Investigation
125 Worth Street
New York, New York 10013
212-442-3372

10. New York State Department of Labor (NYSDOL)
Division of Safety and Health, Engineering Services Unit
State Office Building Campus
Albany, New York 12240-0010

11. New York City Department of Sanitation
125 Worth Street, Room 714
New York, New York 10013
212-566-1066

12. Occupational Safety and Health Administration (OSHA)
Region II - Regional Office
201Varick Street, Room 908
New York, New York 10014
212-337-2378

13. United States Environmental Protection Agency (EPA or USEPA)
Region II

Asbestos NESHAPS Contact
Air and Waste Management Division
(Air Compliance Branch) – USEPA
290 Broadway, 21st Floor
New York, New York 10007-1866
212-637-3660

I. Post all applicable regulations in a conspicuous place at the job site. Assure that the regulations are not altered, defaced or covered by other materials. One copy of each regulation must also be kept at the Asbestos abatement contractor's office.

1.11 CITY/ASBESTOS ABATEMENT CONTRACTOR RESPONSIBILITIES

A. The normal occupants of the Work Areas will be relocated by the City prior to the performance of the abatement work and returned there to at the conclusion of the abatement work, at no cost to the asbestos abatement contractor. However, the asbestos abatement contractor shall protect all furniture and equipment in the Work Areas in a manner as hereinafter specified. In addition, the asbestos abatement contractor shall perform the work of this Contract in a manner that will be least disruptive to the normal use of the non-Work Areas in the building.

B. Asbestos abatement contractor shall be responsible for cleaning all portable items not specifically addressed by the Facility, in the Work Areas, or dispose of same as asbestos contaminated waste.

C. Facility to provide asbestos abatement contractor with a list of items that cannot be removed and need special attention.

D. Facility to stop all deliveries that may be scheduled to the Work Area while work is in progress.

E. Facilities to have authorized personnel on site at all times or supply the asbestos abatement contractor with means of contacting such personnel without unreasonable delay. Such personnel shall have access to all areas, have knowledge of electrical, and air handling equipment. Such personnel shall assist the asbestos abatement contractor in case of any power failure or breakdown to shut down air supply systems, to reset and control all protective systems such as alarms, sprinklers, locks, etc. The Facility shall ensure no active air handling systems are operating within the Work Area.

F. City will not occupy the portions of the building, in which work is being performed during the entire asbestos removal operation, including completion of clean up.

G. Asbestos abatement contractor shall provide a plan for 24 hour job security both for prevention of theft and for barring entry of curious but unprotected personnel into Work Areas, as required by the Department.

H. Asbestos abatement contractor shall provide surveillance by a fire watch and set forth procedures to be taken for the safety of building occupants in the event of an emergency, in accordance with the WPSP and DEP regulations.

I. Should the failure of any utility occur, the City will not be responsible to the asbestos abatement contractor for loss of time or any other expense incurred.

J. Facility will be responsible to notify the asbestos abatement contractor of any planned electrical power shutdowns in order to ensure that there are no power interruptions in the negative air pressure systems.

K. Asbestos abatement contractor shall remove all flammable materials from the work area and all sources of ignition (including but not limited to pilot lights) shall be extinguished.

L. Asbestos abatement contractor shall require a competent person (as defined in OSHA 1926.1101) to perform the following functions and to be on-site continuously for the duration of the project:

1. Monitor the set up of the Work Area enclosure and ensure its integrity.

2. Control entry and exit into the work enclosure.

3. Ensure that employees are adequately trained in the use of engineering controls, proper work practices, proper personal protective equipment and in decontamination procedures.

4. Ensure that employees use proper engineering controls, proper work practices, proper personal protective equipment and proper decontamination procedures.

5. The competent person (as defined in OSHA1926.1101) shall check for rips and tears in work suits, and ensure that they are mended immediately or replaced.

1.12 USE OF BUILDING FACILITIES

A. City shall make available to the asbestos abatement contractor, from existing outlets and supplies, all reasonably required amounts of water and electric power at no charge.

B. Electric power to all Work Areas shall be shut down and locked out except for electrical equipment that must remain in service. Safe temporary power and lighting shall be provided by asbestos abatement contractor in accordance with applicable codes. All power to Work Areas shall be brought in from outside the area through ground-fault interrupter circuits installed at the source. Stationary electrical equipment within the Work Area, which must remain in service, shall be adequately protected, enclosed and ventilated. The Facility will identify all electric lines that must remain in service. Asbestos abatement contractor shall protect all lines.

C. Asbestos abatement contractor shall provide, at his own expense, all electrical, water, and waste connections, tie-ins, extensions, and construction materials, supplies, etc. All water tie-ins shall be hard piped with polyethylene or copper piping. At the end of each shift, asbestos abatement contractor shall disconnect all hoses within the work zone and place in equipment room of the worker decontamination unit. Asbestos abatement contractor shall ensure positive shutoff of all water to Work Area during non-working hours.

D. Utilities:

1. General:
All temporary facilities required to be installed, shall be subject to the approval of the Commissioner. Prior to starting the work at any site; specify clearly the temporary locations of facilities preferably with sketches and submit the same to the Construction Project Manager for approval.

2. Water:
The Department of Design and Construction will furnish all water needed for construction, at no cost to the asbestos abatement contractor in buildings under their jurisdiction. All temporary plumbing or adaptations to supply the needs of the Work Area shall be installed and removed by the asbestos abatement contractor and the cost thereof included in the Lump Sum price for abatement work. Shower water for the decontamination unit shall be provided hot. Heating of water, if necessary, shall be provided by the asbestos abatement contractor.

3. Electricity:
The Department of Design and Construction will furnish all electricity needed for construction, at no cost to the asbestos abatement contractor in buildings under their jurisdiction. All temporary electrical work or adaptations to supply the needs of the Work Area shall be installed and removed by the asbestos abatement contractor and the cost thereof included in the Lump Sum price for abatement work.

In leased spaces, arrangements for water supplies and electricity must be made with the landlord. However, all such arrangements must be made

through and are subject to approval of the Department of Design and Construction. Utilities will be provided at no cost to the asbestos abatement contractor. However, it is the asbestos abatement contractor's (or the General contractor's) responsibility to furnish and install a suitable distribution system to the Work Area. This system will be provided at no cost to the City.

A dedicated power supply for the negative pressure ventilating units shall be utilized. The negative air equipment shall be on a ground fault circuit interrupter (GFCI) protected circuit separate from the remainder of the work area temporary power circuits.

E. Asbestos abatement contractor shall shut down and lock out all electric power to all work areas except for electrical equipment that must remain in service. Safe temporary power and lighting shall be provided in accordance with all applicable codes. Existing light sources (e.g., house lights) shall not be utilized. All power to work areas shall be brought in from outside the area through ground-fault circuit interrupter at the source.

1. If electrical circuits, machinery, and other electrical systems in or passing though the work area must stay in operation due to health and safety requirements, the following precautions must be taken:

   a. All unprotected cables, except low-voltage (less than 24 volts) communication and control system cables, panel boxes of cables and joints in live conduit that run through the work area shall be covered with three (3) independent layers of six (6) mil fire retardant polyethylene. Each layer shall be individually duct taped and sealed. All three (3) layers of polyethylene sheeting shall be left in place until satisfactory clearance air sampling results have been obtained.

   b. Any energized circuits remaining in the work area shall be posted with a minimum two (2) inch high lettering warning sign which reads: DANGER LIVE ELECTRICAL - KEEP CLEAR. A sign shall be placed on all live covered barriers at a maximum of ten (10) foot intervals. These signs shall be posted in sufficient numbers to warn all persons authorized to enter the work area of the existence of the energized circuits.

2. Any source of emergency lighting which is temporarily blocked as a result of work place preparation shall be replaced for the duration of the project by battery operated or temporary exit signs, exit lights, or photo luminescent path markings.

F. Asbestos abatement contractor shall provide a separate temporary electric panel board to power asbestos abatement contractor's equipment. The Facility will designate an existing electrical source in proximity to the Work Area. Asbestos abatement contractor's licensed electrician shall provide temporary tie-in via cable, outlet boxes, junction boxes, receptacles and lights, all with ground fault interruption. At no time shall extension cords greater than 50-feet in length be allowed. All temporary electrical installation shall be in accordance with OSHA regulations. The electric shut down for power panel tie-in will be on off-hours and must be coordinated with the Facility. Asbestos abatement contractor shall provide to the City a specification and drawing outlining his power requirements at the pre-construction meeting.

G. Additional electrical equipment (i.e., transformers, etc.), which is necessary due to the lack of existing power on the floor, shall be at the asbestos abatement contractor's expense.

H. Asbestos abatement contractor shall provide fire protection in accordance with all State and Local fire codes.

I. Sprinklers, standpipes, and other fire suppression systems shall remain in service and shall not be plasticized.

J. When temporary service lines are no longer required, they shall be removed by the asbestos abatement contractor. Any parts of the permanent service lines, grounds and buildings, disturbed or damaged by the installation and/or removal of the temporary service lines, shall be restored to their original condition by asbestos abatement contractor. Senior Stationary Engineer will inspect and test all switches, controls, gauges, etc. and shall submit a list to the Construction Project Manager of any equipment damaged by the asbestos abatement contractor.

K. Asbestos abatement contractor shall supply hot shower water necessary for use in the decontamination unit.

1.13 USE OF THE PREMISES

A. Asbestos abatement contractor shall confine his apparatus, the storage of materials, and supplies, and the operation of his workmen to limits established by law, ordinances, and the directions of the Construction Project Manager and the Facility. All flammable or combustible materials shall be properly stored to obviate fire and in areas approved by the Facility.

B. Asbestos abatement contractor shall assure that no exits from the building are obstructed, that appropriate safety barriers are established to prevent access, and that Work Areas are kept neat, clean, and safe.

C. Asbestos abatement contractor shall maintain exits from the work area or alternative exits shall be established, in accordance with section 1027 of the New York City Fire Code. Exits shall be checked at the beginning and end of each work shift against blockage or impediments to exiting.

D. If the openings of temporary structural partitions related to abatement work areas block egress, the partition shall consist of two sheets of fire retardant 6-mil plastic, prominently marked as an exit with photo luminescent paint or signage. Cutting tools (e.g., knife, razor) shall be attached to the work area side of the sheeting for use in the event that the barrier must be cut open to allow egress.

E. All surrounding work, fixtures, soil lines, drains, water lines, gas pipes, electrical conduit, wires, utilities, duct work railings, shrubbery, landscaping, etc. which are to remain in place shall be carefully protected and, if disturbed or damaged, shall be repaired or replaced as directed by the City, at no additional cost.

F. All routes through the building to be used by the asbestos abatement contractor shall first be approved by the Construction Project Manager and the Facility.

G. Attention is specifically drawn to the fact that other asbestos abatement contractors, performing the work of other Contracts, may be (or are) brought upon any of the work sites of this Contract. Therefore, the asbestos abatement contractor shall not have exclusive rights to any site of his work and shall fully cooperate and coordinate his work with the work of other asbestos abatement contractors who may be on (or are on) any site of the work of this Contract. Regulated area exempted.

H. Temporary toilet facilities must be provided by the asbestos abatement contractor on the site. Coordinate location of facilities with Construction Project Manager. No toilet facilities will be allowed in the Work Area.

1.14 PROTECTION AND DAMAGE

A. The asbestos abatement contractor is responsible to cover all furniture and equipment that cannot be removed from Work Areas. Moveable furniture and equipment will be removed from Work Areas by asbestos abatement contractor prior to start of work and returned upon successful completion of the final air testing. At the conclusion of the work (after clearance level of air testing reaches the acceptable limit), the asbestos abatement contractor will remove all plastic covering from the walls, floors, furniture, equipment and reinstall furniture and equipment in the cleaned Work Area. The asbestos abatement contractor shall remove all shades, curtains and drapes from the Work Area, and reinstall the same following the final clean up.

B. Prior to plasticizing, the proposed work areas shall be pre-cleaned using HEPA filtered vacuum equipment and/or wet cleaning methods. Methods that raise dust, such as sweeping or vacuuming with equipment not equipped with HEPA filters, are prohibited.

C. Use rubber tired vehicles that use non-volatile fuels for conveying material inside building and provide temporary covering, as necessary, to protect floors.

D. No materials or debris shall be thrown from windows or doors of the building. Building waste management system shall NOT be used to remove any asbestos waste from the building.

E. Debris shall be removed from the work site daily. Premises shall be left neat and clean after each work shift, so that work may proceed the next regular workday without interruption. Limited bag storage may take place within the Work Area when approved by the Construction Project Manager.

F. Protect floors and walls along removal routes from damage, wear and staining with contamination control flooring. All finished surfaces to be protected with Masonite or other rigid sheathing material.

G. A preliminary inspection for pre-existing damage shall be conducted by asbestos abatement contractor and representative of the City before commencement of the project.

1.15 RESPIRATORY PROTECTION REQUIREMENTS

A. Respiratory protection shall be worn by all individuals who may be exposed to asbestos fibers from the initiation of the asbestos project until all areas have successfully passed clearance air monitoring in accordance with Regulations and these Specifications.

B. Asbestos abatement contractor shall develop and implement a written respiratory protection program with required site-specific procedures and elements. The program shall be administered by a properly trained individual. The written respiratory protection program shall include the requirements set forth in OSHA Standard 29 CFR 1910.134, at a minimum.

C. The Asbestos abatement contractor shall provide workers with individually issued and marked respiratory equipment. Respiratory equipment shall be suitable for the asbestos exposure level(s) in the Work Area(s), as specified in OSHA Standards 26 CFR 1910.134 and 29 CFR 1926.1101, NIOSH Standard 42 CFR 84, or as more stringently specified otherwise, herein.

D. Where respirators with disposable filter parts are employed, the asbestos abatement contractor will provide sufficient filter parts for replacement as necessary or as required by the applicable regulation.

E. All respiratory protection shall be NIOSH approved. All respiratory protection shall be provided by asbestos abatement contractor, and used by workers in conjunction with the written respiratory protection program.

F. Asbestos abatement contractor shall provide respirators selected by an Industrial Hygienist that meet the following requirements:

Table 1. -- Assigned Protection Factors[5]

Type of Respirator[1,2]	Half mask	Full facepiece	Helmet/hood
1. Air-Purifying Respirator	[3]10	50	……
2. Powered Air-Purifying Respirator (PAPR)	50	1,000	[4]25/1,000
3. Supplied-Air Respirator (SAR) or Airline Respirator			
• Demand mode	10	50	……
• Continuous flow mode	50	1,000	[4]25/1,000
• Pressure-demand or other positive-pressure mode	50	1,000	……
4. Self-Contained Breathing Apparatus (SCBA)			
• Demand mode	10	50	50
• Pressure-demand or other positive-pressure mode (e.g., open/closed circuit)	……...	10,000	10,000

[1]Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.

[2]The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements.

[3]This APF category includes filtering facepieces, and half masks with elastomeric facepieces.

[4]The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25.

[5]These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134 (d)(2)(ii).

G. Selection of high efficiency filters:

1. All high efficiency filters shall have a nominal efficiency rating of 100 (99.97-percent effective) when tested against 0.3-micrometer monodisperse diethyl-hexyl phthalate (DOP) particles.

2. Choose N-, R-, or P-series filters based upon the presence or absence of oil particles.

a. N-series filters shall only be used for non-oil solid and water based aerosols or fumes.

b. R- and P-series filters shall be used when oil aerosols or fumes (i.e., lubricants, cutting fluids, glycerin, etc.) are present. The R-series filters are oil resistant and the P-series filters are oil proof.

c. Follow filter manufacture recommendations.

3. If a vapor hazard exists, use an organic vapor cartridge in combination with the high efficiency filter.

H. Historical airborne fiber level data may serve as the basis for selection of the level of respiratory protection to be used for an abatement task. Historical data provided by the asbestos abatement contractor shall be based on personal air monitoring performed during work operations closely resembling the processes, type of material, control methods, work practices, and environmental conditions present at the site. Documentation of aforementioned results may be requested by the City and/or Third-Party Air Monitor for review. This will not relieve the asbestos abatement contractor from providing personal air monitoring to determine the time-weighted average (TWA) for the work under contract. The TWA shall be determined in accordance with 29 CFR 1926.1101.

I. At no time during actual removal operations shall half-mask air purifying respirators be allowed unless a full 8-hour TWA and excursion limit have been conducted, and reviewed by the Construction Project Manager. If the TWA and excursion limit have not been conducted, a Supplied-Air Respirator (SAR) or Airline Respirator or Self-Contained Breathing Apparatus (SCBA) must be used. Use of single use dust respirators is prohibited for the above respiratory protection.

J. Workers shall be provided with personally issued and individually marked respirators. Respirators shall not be marked with any equipment that will alter the fit of the respirator in any way. Only waterproof identification markers shall be used.

K. Asbestos abatement contractor shall ensure that the workers are qualitatively or quantitatively fit tested by an Industrial Hygienist initially and every 12 months thereafter with the type of respirator he/she will be using.

L. Whenever the respirator design permits, workers shall perform the positive and negative air pressure fit test each time a respirator is worn. Powered air-purifying respirators shall be tested for adequate flow as specified by the manufacturer.

M. No facial hairs (beards) shall be permitted to be worn when wearing respiratory protection that requires a mask-to-face seal.

N. If a worker wears glasses, a spectacle kit to fit their respirator shall be provided by the asbestos abatement contractor at the asbestos abatement contractor's expense.

O. Respiratory protection maintenance and decontamination procedures shall meet the following requirements:

1. Respiratory protection shall be inspected and decontaminated on a daily basis in accordance with OSHA 29 CFR 1910.134 (b); and

2. High efficiency filters for negative pressure respirators shall be changed after each shower; and

3. Respiratory protection shall be the last piece of worker protection equipment to be removed. Workers must wear respirators in the shower when going through decontamination procedures as stated in Section 3.03 and/or 3.04.

4. Airline respirators with high efficiency filtered disconnect shall be disconnected in the equipment room and worn into the shower. Powered air-purifying respirator face pieces shall be worn into the shower. Filtered/power pack assemblies shall be decontaminated in accordance with manufacturers recommendations; and

5. Respirators shall be stored in a dry place and in such a manner that the face-piece and exhalation valves are not distorted; and

6. Organic solvents shall not be used for washing of respirators.

P. Authorized visitors shall be provided with suitable respirators and instruction on the proper use of respirators whenever entering the Work Area. Qualitative fit test shall be done to ensure proper fit of respirator.

1.16 PROTECTIVE CLOTHING

A. Provide worker protection as required by the most stringent OSHA and/or EPA standards applicable to the work. Provide to all workers, foremen, superintendents, authorized visitors and inspectors, protective disposable clothing consisting of full body coveralls, head covers, gloves and 18-inch high boot type covers or reusable footwear.

B. In addition to personal protective equipment for workers, the asbestos abatement contractor shall make available at each worksite at least four (4) additional uniforms and required respiratory equipment each day for personnel who are authorized to inspect the work site. He/she shall also provide, for the duration of the work at any site involving a decontamination unit for worksite access, a lockable storage locker for use by the Construction Project Manager. In addition to respiratory masks for

workers, the asbestos abatement contractor must have on hand at the beginning of each work day, at least four (4) masks each with three sets of fresh filters, for use by personnel who are authorized to inspect the worksite and are medically qualified to don a respirator. The asbestos abatement contractor shall check for proper fit of the respirators of all City personnel authorized to enter the Work Area.

C. Asbestos handlers involved in tent procedures shall wear two (2) disposable suits, including gloves, hood and footwear, and appropriate respiratory equipment. All street clothes shall be removed and stored in a clean room within the work site. The double layer personal protective equipment shall be used for installation of the tent and throughout the procedure, if a decontamination unit (with shower and clean room) is contiguous to the Work Area, only one (1) layer of disposable personal protective equipment shall be required; in this case, prior to exiting the tent the worker shall HEPA vacuum and wet clean the disposable suit.

D. The outer disposable suit (if 2 suits are worn) shall be removed and remain in the tent upon exiting. Following the tent disposal and work site clean up the workers shall immediately proceed to a shower at the work site. The inner disposal unit and respirator shall be removed in the shower after appropriate wetting. The disposal clothing shall be disposed of as asbestos-containing waste material. The workers shall then fully and vigorously shower with supplied liquid bath soap, shampoo, and clean dry towels.

E. Coveralls: provide disposable full-body coveralls and disposable head covers. Require that they be worn by all workers in the Work Area. Provide a sufficient number for all required changes for all workers in the Work Area.

F. Boots: provide work boots with non-skid soles, and where required by OSHA, foot protection, for all workers. Provide boots at no cost to workers. Paint uppers of all boots yellow with waterproof enamel. Do not allow boots to be removed from the Work Area for any reason after being contaminated with ACM and/or dust.

G. Hard Hats: provide hard hats as required by OSHA for all workers, and provide a minimum of four spares for Inspectors, visitors, etc. Label all hats with same warning label as used on disposal bags. Require hard hats to be worn at all times that work is in progress that may cause potential head injury. Provide hard hats of the type with polyethylene strap suspension. Require hats to remain in the Work Area throughout the work. Thoroughly clean and decontaminate and bag hard hats prior to removing them from the Work Area at the end of the work.

H. Goggles: provide eye protection (goggles) as required by OSHA for all workers involved in any activity that may potentially cause eye injury. Require them to be worn at all times during these activities. Thoroughly clean and decontaminate goggles before removing them from the Work Area.

I. Gloves: provide work gloves to all workers, of the type dictated by the Work and OSHA Standards. Do not remove gloves from the Work Area. Dispose of as asbestos contaminated waste at the end of the work. Gloves shall be worn at all times, except during Work Area Preparation activities that do not disturb ACM.

J. Reusable footwear, hard hats and eye protection devices shall be left in the contaminated Equipment Room until the end of the Asbestos Abatement Work.

K. Disposable protective clothing shall be discarded and disposed of as asbestos waste every time the wearer exits from the workspace to the outside through the decontamination facility.

L. Adequate supplies of disposable coveralls, head covers and foot covers shall be maintained by the asbestos abatement contractor for authorized representatives who may inspect the Work Area.

1.17 AIR MONITORING - ASBESTOS ABATEMENT CONTRACTOR

A. Asbestos abatement contractor shall employ a qualified industrial hygiene firm to conduct OSHA personal exposure monitoring air samples in accordance with OSHA Regulations, 1926.1101 (Asbestos Standards for Construction) to establish representative full shift monitoring data, per task, to determine respiratory protection. The asbestos abatement contractor may submit representative Personal exposure monitoring data for a project of similar size and complexity in lieu of performing monitoring in accordance with OSHA 29CFR 1926.1101.

B. The asbestos abatement contractor shall ensure that a qualified industrial hygiene laboratory for OSHA personal exposure monitoring is utilized. Such laboratory shall be a current proficient participant in the American Industrial Hygiene Association (AIHA) PAT Program. The laboratory shall be accredited by the AIHA and New York State Department of Health Environmental Laboratory Approval Program (ELAP).

C. Sampling and analysis methods shall be per NIOSH 7400A.

D. Test Reports:

1. Promptly process and distribute one copy of the test results, to the Commissioner via email.

2. Prompt reports are necessary so that if required, modifications to work methods and/or practices may be implemented as soon as possible.

3. Asbestos abatement contractor shall post the personal exposure monitoring results at the jobsite within 24 hours of receipt of the results.

E. Competent person shall conduct inspections and provide written reports daily. Inspections will include checking the standard operating procedures, engineering control systems, respiratory protection and decontamination systems, packaging and disposal of asbestos waste, and any other aspects of the project which may affect the health and safety of the people and environment.

F. All costs for required the asbestos abatement contractor's air monitoring shall be borne by the asbestos abatement contractor.

G. The City reserves the right to conduct air and surface dust sampling in conjunction with and separate from the Third-Party Air Monitor for the purposes of Quality Assurance.

1.18 THIRD PARTY MONITORING AND LABORATORY

A. The NYCDDC, at its own expense, will employ the services of an independent Third Party Air Monitoring Firm and Laboratory. The Third Party Air Monitor will perform air sampling activities and project monitoring at the Work Site.

B. The Laboratory will perform analysis of air samples utilizing Phase Contrast Microscopy (PCM) and/or Transmission Electron Microscopy (TEM). This laboratory shall meet the standards stated in Paragraph 1.17. B.

C. Observations will include, but not be limited to, checking the standard operating procedures, engineering control systems, respiratory protection, decontamination systems, packaging and disposal of asbestos waste, and any other aspects of the project that may affect the health and safety of the environment, Asbestos abatement contractor, and/or facility occupants.

D. The Third Party Air Monitoring Firm and the designated Project Monitor shall have access to all areas of the asbestos removal project at all times and shall continuously inspect and monitor the performance of the asbestos abatement contractor to verify that said performance complies with this Specification. The Third-Party Air Monitor shall be on site throughout the entire abatement operation.

E. The NYCDDC will be responsible for costs incurred with the Third Party Air Monitoring Firm and laboratory work. Any subsequent additional testing required due to limits exceeded during initial testing shall be paid for by the Asbestos abatement contractor.

F. At a minimum, air sampling shall be conducted in accordance with the following schedule:

2. Samplers shall be located within the proposed work area and at all proposed isolation barrier locations.

3. Samples shall be analyzed using PCM.

4. The number of samples to be collected will be determined by the size of the project and the abatement methods to be utilized.

I. Frequency and duration of the air sampling during abatement shall be representative of the actual conditions during the abatement. The size of the asbestos project will be a factor in the number of samples required to monitor the abatement activities. The following minimum schedule of samples shall be required daily.

1. For large asbestos projects employing full containment, area air sampling shall be performed at the following locations:

a. Two area samples outside the work area in uncontaminated areas of the building, remote from the decontamination facilities.

(1) Primary location selection shall be within 10 feet of isolation barriers.

(2) Where negative ventilation exhaust runs through uncontaminated building areas, one of the area samples will be required in these areas to monitor any potential fiber release.

(3) Where exhaust tubes have been grouped together in banks of up to five (5) tubes, with each tube exhausting separately and the bank of tubes terminating together at the same controlled area, one area air sample shall be taken.

b. One area sample within the uncontaminated entrance to each decontamination enclosure system.

c. Where adjacent non-work areas do not exist, an exterior area sample shall be taken.

d. One area sample within 5 feet of the unobstructed exhaust from a negative pressure ventilation system exhausting indoors but not within a duct.

e. One area sample outside, but within 25 feet of, the building or structure, if the entire building or structure is the work area.

2. For large asbestos projects involving interior foam method, area air sampling shall be performed at the following sampling locations:

    a. One area sample taken outside the work area within 10 feet of isolation barriers.

    b. One area sample taken within the uncontaminated entrance to each worker decontamination and waste decontamination enclosure system.

    c. One area sample within 5 feet of the unobstructed exhaust from a negative pressure ventilation system exhausting indoors but not within a duct, if applicable.

    d. Three area samples inside the work area.

    e. One area sample where the negative ventilation exhaust ducting runs through uncontaminated building areas, if applicable.

3. For large asbestos projects employing the glovebag procedure within a tent, a minimum of five continuous air samples shall be taken concurrently with the abatement for each work area, unless there are more than three enclosures, in which case two area samples per enclosure are required.

    a. Four area samples taken outside the work area within ten feet of tent enclosure(s).

    b. One area sample taken within the uncontaminated entrance to each worker and waste decontamination enclosure system.

    c. One area sample within five feet of the unobstructed exhaust from a negative pressure ventilation system exhausting indoors, but not within a duct, if applicable.

    d. One area sample where negative ventilation exhaust ducting runs through uncontaminated building areas, if applicable.

4. For large asbestos projects involving exterior foam method or removal of ACM from vertical surfaces, a minimum of five continuous area samples shall be taken concurrently with the abatement for each work area using the following minimum requirements:

    a. Three area samples inside the work area and remote from the decontamination systems.

b. One area sample within the uncontaminated entrance to each worker and waste decontamination enclosure system.

c. One area sample outside the work area within 25 feet of the building or structure, if the entire building or structure is the work area.

d. One area sample inside the building or structure at the egress point to the work area, if applicable.

5. For small asbestos projects employing full containment, a minimum of three continuous area samples shall be taken concurrently with the abatement for each work area at the following locations:

a. Two area samples taken outside the work area within ten feet of the isolation barriers.

b. One area sample within the uncontaminated entrance to each worker or waste decontamination enclosure system.

c. One area sample within five feet of the unobstructed exhaust from a negative pressure ventilation system exhausting indoors, but not within a duct, if applicable.

d. One area sample where negative ventilation exhaust ducting runs through an uncontaminated building area, if applicable.

6. Tent Procedures:
For projects involving more than 25 linear feet or 10 square feet, a minimum of three continuous samples shall be taken concurrently throughout abatement.

J. Post-abatement clearance air monitoring for projects not solely employing glove-bag procedures shall include a minimum number of area samples inside each homogeneous work area and outside each homogeneous work area (five samples inside/five samples outside for Large Projects and three samples inside/three samples outside for Small Projects). In addition to the five sample inside/five sample outside minimum for Large Projects, one additional representative area sample shall be collected inside and outside the work area for every 5,000 square feet above 25,000 square feet of floor space where ACM has been abated.

K. Post-abatement clearance air monitoring for Small Projects solely employing glove-bag procedures is not required unless one or more of the following events occurs. In such cases, post-abatement clearance air monitoring procedures shall be followed. The events requiring post-abatement clearance air monitoring are:

1. The integrity of the glove-bag was compromised,

2. Visible emissions are detected outside the glove-bag, and/or

3. Ambient levels exceed 0.01 f/cc during abatement.

L. Monitoring requirements for other than post-abatement clearance air monitoring are as follows:

1. The sampling zone for indoor air samples shall be representative of the building occupants' breathing zone.

2. If possible, outdoor ambient and baseline samplers should be placed about 6 feet above the ground surface in reasonable proximity to the building and away from obstructions and drafts that may unduly affect airflow.

3. For outdoor samples, if access to electricity and concerns about security dictate a rooftop site, locations near vents and other structures on the roof that would unduly affect airflow shall be avoided.

4. Air sampling equipment shall not be placed in corners of rooms or near obstructions such as furniture.

5. Samples shall have a chain of custody record.

M. Post-abatement clearance air monitoring requirements are as follows:

1. Sampling shall not begin until at least one hour after wet cleaning has been completed and no visible pools of water or condensation remain.

2. Samplers shall be placed at random around the work area. If the work area contains the number of rooms equivalent to the number of required samples based on floor area, a sampler shall be placed in each room. When the number of rooms is greater than the required number of samples, a representative sample of rooms shall be selected.

3. The representative samplers placed outside the work area but within the building shall be located to avoid any air that might escape through the isolation barriers and shall be approximately 50 feet from the entrance to the work area, and 25 feet from the isolation barriers.

N. The following aggressive sampling procedures shall be used within the work area during all clearance air monitoring:

1. Before starting the sampling pumps, use forced air equipment (such as a one

horsepower leaf blower) to direct exhaust air against all walls, ceilings, floors, ledges and other surfaces in the work area. This pre-sampling procedure shall take at least five minutes per 1,000 square feet of floor area; then

2. Place a 20-inch diameter fan in the center of the room. Use one fan per 10,000 cubic feet of room space. Place the fan on slow speed and point it toward the ceiling.

3. Start the sampling pumps and sample for the required time or volume.

4. Turn off the pump and then the fan(s) when sampling is completed.

5. Collect a minimum number of area samples inside and outside each homogeneous work area (five inside/five outside samples for Large Projects and three inside/three outside samples for Small Projects). In addition to the minimum for Large Projects, one representative area samples shall be collected inside and outside the work area for every 5,000 square feet above 25,000 square feet of floor space where ACM has been abated.

O. For post-abatement monitoring, area samples shall conform to the following schedule:

Area Samples for Analysis by	Minimum Volume	Flow Rate
PCM	1,800 liters	5 to 15 liters/minute
TEM	1,250 liters	1 to 10 liters/minute

1. Each homogeneous work area that does not meet the clearance criteria shall be thoroughly re-cleaned using wet methods, with the negative pressure ventilation system in operation. New samples shall be collected in the work area as described above. The process shall be repeated until the work site meets the clearance criteria.

2. For an asbestos project with more than one homogeneous work area, the release criterion shall be applied independently to each work area.

3. Should airborne fiber concentrations exceed the clearance criteria, the asbestos abatement contractor shall re-clean the work area utilizing wet wiping and HEPA-vacuuming techniques. Following completion of re-cleaning activities, the Third-Party Air Monitor will perform an observation of the Work Area. If the Third-Party Air Monitor determines that the work was performed in accordance with the specifications, the appropriate settling period will be observed and additional air sampling will be performed.

4. All costs resulting from additional air tests and observations shall be borne

by the asbestos abatement contractor. These costs may include, but are not limited to, labor, analysis fees, materials, and expenses.

5. After the area has been found to be in compliance, the asbestos abatement contractor may remove Isolation Barriers and perform final cleaning as specified.

P. Clearance and/or Re-occupancy Criteria:

1. The clearance criteria shall be applied to each homogeneous work area independently.

2. For PCM analysis, the clearance air monitoring shall be considered satisfactory when each of the 5 inside/5 outside samples for Large Projects and/or 3 inside/3 outside samples for Small Projects is less than or equal to 0.01 f/cc or the background concentrations, whichever is greater.

3. For TEM analysis, the clearance air monitoring shall be considered satisfactory when the requirements stated in 40 CFR Part 763, Subpart E, Appendix A, Section IV are met.

4. As soon as the air monitoring tests are completed and analyzed, the Third-Party Air Monitor will send the results of such tests to the City and notify the Asbestos abatement contractor.

5. The asbestos abatement contractor shall initiate the appropriate closeout process in DEP ARTS within 24 hours of the Re-occupancy letter being issued by the Third-Party Air Monitoring Firm. This will allow the Third-Party Air Monitoring Firm to complete and submit the ACP-15 forms for each specific work area.

6. The asbestos abatement contractor shall provide the ACP-20 and ACP-21 forms to the general contractor within 48 hours of receipt by DEP.

1.19 TAMPERING WITH TEST EQUIPMENT

All parties to this Contract are hereby notified that any tampering with testing equipment will be considered an attempt at falsifying reports and records to federal and state agencies and each offense will be prosecuted under applicable state and federal criminal codes to the fullest extent possible.

1.20 GUARANTEE

A. Work performed in compliance with this Contract shall be guaranteed for a period of one year from the date the completed work is accepted by the City.

B. The asbestos abatement contractor shall not be held liable for the guarantee where the repair required under the guarantee is a result of obvious abuse or vandalism, as determined by the Commissioner.

C. The City will notify the asbestos abatement contractor in writing regarding defects in work under the guarantee.

PART 2 – PRODUCTS

2.01 MATERIAL HANDLING

A. Deliver all materials to the job site in their manufacturer's original container, with the manufacturer's label intact and legible.

1. Maintain packaged materials with seals unbroken and labels intact until time of use.

2. Store all materials on pallets, away from any damp and/or wet surface. Cover materials in order to prevent damage and/or contamination.

3. Promptly remove damaged materials and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the City.

B. The Construction Project Manager may reject as non-complying such material and products that do not bear identification satisfactory to the Construction Project Manager as to manufacturer, grade, quality and other pertinent information.

2.02 MATERIALS

A. Wetting agents: (Surfactant) shall consist of resin materials in a water base, which have been tested to ensure materials are non-toxic and non-hazardous. Surfactants shall be installed according to the manufacturer's written instructions.

B. Encapsulants: Liquid material which can be applied to asbestos-containing material which temporarily controls the possible release of asbestos fibers from the material or surface either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant). A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.

C. During abatement activities, replacement materials shall be stored outside the work area in a manner to prevent contamination. Materials required for the asbestos project (i.e., plastic sheeting, replacement filters, duct tape, etc.) shall be stored to prevent damage or contamination.

D. Framing Materials and Doors: As required to construct temporary decontamination facilities and isolation barriers. Lumber shall be high grade, new, finished one side and fire retardant.

E. Fire Retardant Polyethylene Sheeting: minimum uniform thickness of 6-mil. Provide largest size possible to minimize seams. All materials used in the construction of temporary enclosures shall be noncombustible or fire-retardant in accordance with NFPA 701 and 255.

F. Fire Retardant Reinforced Polyethylene Sheeting: For covering floor of decontamination units, provide translucent, nylon reinforced or woven polyethylene laminated, fire retardant polyethylene sheeting. Provide largest size possible to minimize seams, minimum uniform thickness 6-mil. All materials used in the construction of temporary enclosures shall be noncombustible or fire-retardant in accordance with NFPA 701 and 255.

G. Drums: Asbestos-transporting drums, sealable and clearly marked with warning labels as required by OSHA and EPA.

H. Polyethylene Disposal Bags: Asbestos disposal bags, minimum of fire retardant 6-mil thick. Bags shall be clearly marked with warning labels as required by OSHA and EPA.

I. Signs: Asbestos warning signs for posting at perimeter of Work Area, as required by OSHA and EPA.

J. Waste Container Bag Liners and Flexible Trailer Trays: One piece leak-resistant flexible tray with absorbent pad.

K. Tape: Provide tape which is of high quality with an adhesive that is formulated to aggressively stick to sheet polyethylene.

L. Spray Adhesive: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.

M. Flexible Duct: Spiral reinforced flex duct for air filtration devices.

N. Protective Clothing: Workers shall be provided with sufficient sets of properly fitting, full-body, disposable coveralls, head covers, gloves, and 18-inch high

boot-type foot covers. Protective clothing shall conform to OSHA Standard 29 CFR 1926.1101.

O. Surfactants, strippers, sealers, or any other chemicals used shall be non-carcinogenic and non-toxic.

P. Materials used in the construction of temporary enclosures shall be noncombustible or fire-retardant in accordance with NFPA 701 and 255.

2.03 TOOLS AND EQUIPMENT

A. Air Filtration Device (AFD): AFDs shall be equipped with High Efficiency Particulate Air (HEPA) filtration systems and shall be approved by and listed with Underwriter's Laboratory.

B. Scaffolding: All scaffolding shall be designed and constructed in accordance with OSHA (29 CFR 1926/1910), New York City Building Code, and any other applicable federal, state and local government regulations. Whenever there is a conflict or overlap of the above references the most stringent provisions are applicable. All scaffolding and components shall be capable of supporting without failure a minimum of four times the maximum intended load, plus an allowance for impact. All scaffolding and staging must be certified in writing by a Professional Engineer licensed to practice in the State of New York.

1. Equip rungs of all metal ladders, etc., with an abrasive, non-slip surface.

2. Provide non-skid surface on all scaffold surfaces subject to foot traffic. Scaffold ends and joints shall be sealed with tape to prevent penetration of asbestos fibers.

C. Transportation Equipment: Transportation Equipment, as required, shall be suitable for loading, temporary storage, transit and unloading of asbestos contaminated waste without exposure to persons or property. Any temporary storage containers positioned outside the building for temporary storage shall be metal, closed and locked.

D. Vacuum Equipment: All vacuum equipment utilized in the Work Area shall utilize HEPA filtration systems.

E. Vacuum Attachments: Soft Brush Attachment, Asbestos Scraper Tool, Drill Dust Control Kit.

F. Electric Sprayer: An electric airless sprayer suitable for application of encapsulating material and shall be approved by and listed with Underwriters Laboratory.

G. Water Sprayer: The water sprayer shall be an airless or other low-pressure sprayer for amended water application.

H. Water Atomizer: Powered air-misting device equipped with a ground fault interrupter and equipped to operate continuously.

I. Brushes: All brushes shall have nylon bristles. Wire brushes are excluded from use due to their potential to shred asbestos fibers into small, fine fibers.

J. Power tools used to drill, cut into, or otherwise disturb ACM shall be manufacturer-equipped with HEPA filtered local exhaust ventilation. Abrasive removal methods, including the use of beadblasters, are prohibited.

K. Other Tools and Equipment: Asbestos abatement contractor shall provide other suitable tools for the stripping, removal, encapsulation, and disposal activities including but not limited to: hand-held scrapers, sponges, rounded-edge shovels, brooms, and carts.

L. Fans and Leaf Blower: Provide Leaf Blower (one leaf blower per floor) and one 20-inch diameter fans for each 10,000 cubic feet of Work Area volume to be used for aggressive sampling technique for clearance air testing.

M. Fire Extinguishers: At least one fire extinguisher with a minimum rating 2-A:10-B:C shall be required for each work place. In the case of large asbestos projects, at least two such fire extinguishers shall be required.

N. First Aid Kits: Asbestos abatement contractor shall maintain adequately stocked first aid kits in the clean rooms of the decontamination units and within Work Areas. The first aid kit shall be approved by a licensed physician for the work to be performed under this Contract.

O. Water Service:

1. Temporary Water Service Connection: All connections to the Facilities water system shall include back flow protection. Valves shall be temperature and pressure rated for operation of the temperature and pressures encountered. After completion of use, connections and fittings shall be removed without damage or alteration to existing water piping, and equipment. Leaking or dripping fittings/valves shall be repaired and or replaced as required.

2. Water Hoses: Employ new heavy-duty abrasion-resistant hoses with a pressure rating greater than the maximum pressure of the water distribution system to provide water into each Work Area and to each Decontamination

Enclosure Unit. Provide fittings as required for connection to existing wall hydrants or spouts, as well as temporary water heating equipment, branch piping, showers, shut-off nozzles and equipment.

3. Water Heater: Provide UL rated 40-gallon electric water heaters to supply hot water for Personal Decontamination Enclosure System Shower. Activate from 30 Amp Circuit breakers located within the Decontamination Enclosure sub panel. Provide relief valve compatible with water heater operations, pipe relief valve down to drip pan at floor level with type 'L' copper piping. Drip pans shall be 6-inch deep and securely fastened to water heater. Wiring of the water heater shall comply with NEMA, NECA, and UL standards.

P. Electrical Service:

1. General: Comply with applicable NEMA, NEC and UL standards and governing regulations for materials and layout of temporary electric service.

2. Temporary Power: Provide service to decontamination unit sub panel with minimum 60 AMP, two pole circuit breaker or fused disconnect connected to the building's main distribution panel. Sub panel and disconnect shall be sized and equipped to accommodate all electrical equipment required for completion of the work.

3. Voltage Differences: Provide identification warning signs at power outlets that are other than 110-120 volt power. Provide polarized outlets for plug-in type outlets, to prevent insertion of 110-120 volt plugs into higher voltage outlets. Dry type transformers shall be provided where required to provide voltages necessary for work operations.

4. Ground Fault Protection: Equip all circuits for any purpose entering Work Area with ground fault circuit interrupters (GFCI). Locate the GFCIs outside the Work Area so that all circuits are protected prior to entry to Work Area. Provide circuit breaker type ground fault circuit interrupters (GFCI) equipped with test button and reset switch for all circuits to be used for any purpose in Work Area, decontamination units, exterior, or as otherwise required by NECA, OSHA or other authority.

5. Power Distribution System: Provide circuits of adequate size and proper characteristics for each use. In general run wiring overhead, and rise vertically where wiring will be least subject to damage from operations.

6. Temporary Wiring: In the Work Area shall be type UF non-metallic sheathed cable located overhead and exposed for surveillance. Provide liquid tight enclosures or boxes for all wiring devices. Do not wire temporary lighting with plain, exposed (insulated) electrical conductors.

7. Electrical Power Cords: Use only grounded extension cords; use hard service cords where exposed to traffic and abrasion. Use single lengths of cords only.

8. Temporary Lighting: All lighting within the Work Area shall be liquid and moisture proof and designed for the use intended.

    a. Provide sufficient temporary lighting to ensure proper workmanship everywhere; by combined use of daylight, general lighting, and portable plug-in task lighting.

    b. Provide lighting in the Decontamination Unit as required to supply a minimum 50-foot candle light level.

9. If electrical circuits, machinery, and other electrical systems in or passing though the work area must stay in operation due to health and safety requirements, the following precautions must be taken:

    a. All unprotected cables, except low-voltage (less than 24 volts) communication and control system cables, panel boxes of cables and joints in live conduit that run through the work area shall be covered with three (3) independent layers of six (6) mil fire retardant polyethylene. Each layer shall be individually duct taped and sealed. All three (3) layers of polyethylene sheeting shall be left in place until satisfactory clearance air sampling results have been obtained.

2.04 CLEANING

A. Throughout the construction period, the asbestos abatement contractor shall maintain the building as described in this Section.

1. The asbestos abatement contractor shall prevent building areas other than the Work Area from becoming contaminated with asbestos-containing dust or debris. Should areas outside the Work Area become contaminated with asbestos-containing dust or debris as a consequence of the asbestos abatement contractor's work practices, the asbestos abatement contractor shall be responsible for cleaning these areas in accordance with the procedures appended in Title 15, Chapter 1 of RCNY and NYSDOL ICR56. All costs incurred in cleaning or otherwise decontaminating non-Work Areas and the contents thereof shall be borne by the asbestos abatement contractor at no additional cost to the City.

2. The asbestos abatement contractor shall provide to all personnel and laborers the required equipment and materials needed to maintain the specified standard of cleanliness.

B. General

1. Waste water from asbestos removal operations, including shower water, may be discharged into the public sewer system only after approved filtration is on operation to remove asbestos fibers.

2. Asbestos wastes shall be double bagged in six mil fire retardant polyethylene bags approved for ACM disposal and shall be properly labeled and handled before disposal.

3. All waste generated shall be bagged, wrapped or containerized immediately upon removal. The personal and waste decontamination enclosure systems and floor and scaffold surfaces shall be HEPA vacuumed and wet cleaned at the end of each work shift at a minimum.

4. The asbestos abatement contractor shall use corrugated cartons or drums for disposal of asbestos-containing waste having sharp edged components (e.g., nails, screws, metal lathe and tin sheeting) that may tear polyethylene bags and sheeting. The waste within the drums or cartons must be double bagged.

5. The asbestos abatement contractor shall transport all bags of waste to disposal site in thirty gallon capacity metal or fiber drums with tight lids, or in locked steel dumpster.

6. Dumping of debris, waste or bagged waste will not be permitted.

7. The waste decontamination enclosure system shall be wet cleaned twice using wet cleaning methods upon completion of waste removal. When the worker decontamination enclosure shower room alternates as a waste container wash room, the shower room shall be washed immediately with cloths or mops saturated with a detergent solution prior to wet cleaning.

8. Excessive water accumulation or flooding in the work area shall require work to stop until the water is collected and disposed of properly.

9. ACM shall be collected utilizing rubber dust pans and rubber squeegees.

10. HEPA vacuums shall not be used on wet materials unless specifically designed for that purpose.

11. Metal shovels shall not be used within the work area.

12. Mastic solvent when used will be applied in moderation (e.g., by airless sprayer). Saturation of the concrete floor with mastic solvent must be avoided.

13. The asbestos abatement contractor shall retain all items in the storage area in an orderly arrangement allowing maximum access, not impeding traffic, and providing the required protection of all materials.

14. The asbestos abatement contractor shall not allow accumulation of scrap, debris, waste material, and other items not required for use in this work. When asbestos contaminated waste must be kept on the work site overnight or longer, it shall be double bagged and stored in accordance with New York City Department of Sanitation (DSNY) regulation Title 16 Chapter 8, and Federal, State and City laws.

15. At least twice a week (more if necessary), the asbestos abatement contractor shall completely remove all scrap, debris and waste material from the job site.

16. The asbestos abatement contractor shall provide adequate storage space for all items awaiting removal from the job site, observing all requirements for fire protection and concerns for the environment.

17. All respiratory protection equipment shall be selected from the latest NIOSH Certified Equipment list.

18. Daily and more often, if necessary, the asbestos abatement contractor shall inspect the Work Areas and adjoining spaces, and pick up all scrap, debris, and waste material. All such items shall be removed to the place designated for their storage.

19. Weekly, and more often, if necessary, the asbestos abatement contractor shall inspect all arrangements of materials stored on the site; re-stack and tidy them or otherwise service them to meet the requirements of these Specifications.

20. The asbestos abatement contractor shall maintain the site in a neat and orderly condition at all times.

PART 3 – EXECUTION

3.01 WORKER DECONTAMINATION FACILITY

A. Large Asbestos Projects:

1. Provide a worker decontamination facility in accordance with, Title 15, Chapter 1, OSHA Standard 29 CFR 1926.1101, 12NYCRR Part 56 and as specified herein. Unless approved by NYCDEP and the City, worker decontamination facilities shall be attached to the Work Areas

a. Structure:

(1) Use modular systems or build using wood or metal frame studs, joists, and rafters placed at a maximum of 16 inches on-center.

(2) When worker decontamination unit is located outdoors, in areas with public access, or in correctional facilities, frame work shall be lined with minimum 3/8” thickness fire rated plywood sheathing. Sheathing shall be caulked or taped airtight at all joints and seams.

(3) Interior shall be covered with two layers of fire retardant 6-mil polyethylene sheeting, with a minimum overlap of 12 inches at seams. Seal seams airtight using tape and adhesive. The interior floor shall be covered with two (2) layers of reinforced fire-retardant polyethylene sheeting with a minimum overlap on the walls of 12 inches.

(4) Entrances to the decontamination unit shall be secured with lockable hinged doors. Doors shall be open at all times when abatement operations are in progress. Doors shall be louvered to allow for air movement through the decontamination units into Work Area.

b. Curtained Doorways: A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms.

c. Air Locks: Air locks shall consist of two curtained doorways placed a minimum of three feet apart. The curtained doorways shall consist of 3 overlapping sheets of fire retardant 6-mil polyethylene sheeting, with alternating entrances and weighted at the bottom.

d. Decontamination Enclosure System shall be placed adjacent to the Work Area and shall consist of three totally enclosed chambers, separated from Work Area and each other by airlocks, as follows:

(1) Equipment Room: The equipment room shall have a curtain doorway to separate it from the Work Area, and share a common airlock with the shower room. The equipment room shall be large enough to accommodate at least one worker (allowing them enough room to remove their protective clothing and footwear), and a fire retardant 6-mil disposal bag for collection of discarded clothing and equipment. The equipment room shall be utilized for the storage of equipment and tools after decontamination using a HEPA-vacuum and/or wet cleaning. A one-day supply of replacement filters, in sealed containers, for HEPA-vacuums and negative air machines, extra tools, containers of surfactant, and other materials and equipment required for the project shall be stored here. A walk-off pan filled with water shall be placed in the Work Area just outside the equipment room for persons to clean foot coverings when leaving the Work Area. Contaminated footwear and reusable work clothing shall be stored in this room.

(2) Shower Room: The shower room shall have two airlocks (one that separates it from the equipment room and one that separates it from the clean room). The shower room shall contain at least one shower, with hot and cold water adjustable at the tap, per six workers. Careful attention shall be given to the shower to ensure against leaking of any kind and shall contain a rigid catch basin at least six inches deep. Asbestos abatement contractor shall supply towels, shampoo and liquid soap in the shower room at all times. Shower water shall be continuously drained, collected, and filtered through a system with at least a 5-micron particle size collection capacity. A system containing a series of several filters with progressively smaller pore sizes shall be used to avoid rapid clogging of the filters by large particles. Pumps shall be installed, maintained and utilized in accordance with manufacturer's recommendations. Filtered water shall be discharged in accordance with applicable codes. Contaminated filters shall be disposed of as asbestos waste.

(3) Clean Room: The clean room shall share a common airlock with the shower room and shall have a curtained doorway to separate it from outside non-contaminated areas. Lockers, for

storage of workers' street clothing, and shelves, for storing respirators, shall be provided in this area. Clean disposable clothing, replacement filters for respirators, and clean dry towels shall be provided in the clean room. The clean room shall not be used for the storage of tools, equipment or other materials.

B. Small Asbestos Projects:

1. Provide a worker decontamination facility in accordance with, Title 15, Chapter 1, OSHA Standard 29 CFR 1926.1101, 12NYCRR Part 56 and as specified herein. Unless approved by NYCDEP and the City, worker decontamination facilities shall be attached to the Work Areas.

2. The worker decontamination enclosure system shall consist of, at a minimum, an equipment room, a shower room, and a clean room separated from each other and from the work area by curtained doorways. The equipment storage, personnel gross decontamination and removal of disposal clothing shall occur in the equipment room prior to entering the shower. All other requirements shall be the same as described above for a large asbestos project.

3. For small asbestos projects with only one exit from the work area, the shower room may be used as a waste washroom. The clean room shall not be used for waste storage. All other requirements shall be the same as described above for a large asbestos project.

C. Decontamination Enclosure System Utilities: Lighting, heat, and electricity shall be provided as necessary by the Asbestos abatement contractor, and as specified herein.

3.02 WASTE DECONTAMINATION FACILITY

A. Large Asbestos Project (Small Project Option)

1. Provide a worker decontamination facility in accordance with, Title 15, Chapter 1, OSHA Standard 29 CFR 1926.1101, 12NYCRR Part 56 and as specified herein. Unless approved by NYCDEP and the City, worker decontamination facilities shall be attached to the Work Areas.

a. Structure:

(1) Use modular systems or build using wood or metal frame studs, joists, and rafters placed at a maximum of 16 inches on-center.

(2) When worker decontamination unit is located outdoors, in areas with public access, or in correctional facilities, frame work shall be lined with minimum 3/8" thickness fire rated plywood sheathing. Sheathing shall be caulked or taped airtight at all joints and seams.

(3) Interior walls shall be covered with two layers of fire retardant 6-mil polyethylene sheeting, with a minimum overlap of 12 inches at seams. Seal seams airtight using tape and adhesive. The interior floor shall be covered with two (2) layers of reinforced fire-retardant polyethylene sheeting with a minimum overlap on the walls of 12 inches.

(4) Entrances to the decontamination unit shall be secured with lockable hinged doors. Doors shall be open at all times when abatement operations are in progress. Doors shall be louvered to allow for air movement through the decontamination units into the Work Area.

b. Curtained Doorways: A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms.

c. Air Locks: Air locks shall consist of two curtained doorways placed a minimum of three feet apart. The curtained doorways shall consist of 3 overlapping sheets of fire retardant 6-mil polyethylene sheeting, with alternating entrances and weighted at the bottom.

d. Decontamination Enclosure System shall be located outside the work area and attached to all locations through which ACM waste will be removed from the work area and shall consist of two totally enclosed chambers, separated from the Work Area and each other by airlocks, as follows:

(1) Washroom: An equipment washroom shall have two air locks (one separating the unit from the Work Area and one common air lock that separates it from the holding area). The washroom shall have facilities for washing material containers and equipment. Gross removal of dust and debris from contaminated material containers and equipment shall be accomplished in the Work Area, prior to moving to the washroom.

B. Holding Area: A holding area shall share a common air lock with the equipment washroom and shall have a curtained doorway to outside areas. A hinged, lockable door

shall be placed at the holding area entrance to prevent unauthorized access into the Work Area.

C. Small Asbestos Project:

1. The worker decontamination enclosure system shall consist of, as a minimum, an equipment room, a shower room, and a clean room separated from each other and from the work area by curtained doorways. The equipment storage, personnel gross decontamination and removal of disposal clothing shall occur in the equipment room prior to entering the shower. All other requirements shall be the same as described above for a large asbestos project.

2. For small asbestos projects with only one exit from the work area, the shower room may be used as a waste washroom. The clean room shall not be used for waste storage. All other requirements shall be the same as described above for a large asbestos project.

D. Decontamination Enclosure System Utilities: Lighting, heat, and electricity shall be provided as necessary by the Asbestos abatement contractor, and as specified herein.

3.03 PERSONNEL ENTRANCE AND DECONTAMINATION PROCEDURES FOR REMOVAL OPERATIONS UTILIZING REMOTE DECONTAMINATION FACILITIES

A. All individuals who enter the Work Area shall sign the entry log, located in the clean room, upon each entry and exit. The log shall be permanently bound and shall fully identify the facility, agents, asbestos abatement contractor(s), the project, each Work Area, and worker respiratory protection employed. The asbestos handler supervisor shall be responsible for the maintenance of the log during the abatement activity. The log shall be submitted to the NYC DDC within 48 hours of request.

B. Each worker shall remove street clothes in the clean room; wear two disposable suits, including gloves, hoods and non-skid footwear; and put on a clean respirator (with new filters) before entering the Work Area.

C. Each worker shall, before leaving the Work Area or tent, clean the outside of the respirators and outer layer of protective clothing by wet cleaning and/or HEPA-vacuuming. The outer disposable suit shall be removed in the airlock prior to proceeding to the Worker Decontamination Unit. The inner disposable suit and respirator shall be wet wiped and HEPA vacuumed thoroughly before removing and prior to aggressive shower.

D. Following showering and drying off, each worker or authorized visitor shall proceed directly to the clean room, dress in street clothes, and exit the decontamination enclosure system immediately.

3.04 PERSONNEL ENTRANCE AND DECONTAMINATION PROCEDURES FOR REMOVAL OPERATIONS UTILIZING ATTACHED DECONTAMINATION FACILITIES

A. All workers and authorized visitors shall enter the Work Area through the worker decontamination facility.

B. All individuals who enter the Work Area shall sign the entry log, located in the clean room, upon each entry and exit. The log shall be permanently bound and shall identify fully the facility, agents, asbestos abatement contractor(s), the project, each Work Area and worker respiratory protection employed. The site supervisor shall be responsible for the maintenance of the log during the abatement activity. The log shall be submitted to the NYC DDC within 48 hours of request.

C. Each worker or authorized visitor shall, upon entering the job site, remove street clothes in the clean room and put on a clean respirator with filters, and clean protective clothing before entering the Work Area through the shower room and equipment room.

D. Each worker or authorized visitor shall, each time he leaves the Work Area, remove gross contamination from clothing before leaving the Work Area; proceed to the equipment room and remove clothing except the respirator; still wearing the respirator, proceed to the shower room; clean the outside of the respirator with soap and water while showering; remove filters, wet them, and dispose of them in the container provided for that purpose; wash and rinse the inside of the respirator; and thoroughly shampoo and wash himself/herself.

E. Following showering and drying off, each worker or authorized visitor shall proceed directly to the clean room, dress in street clothes, and exit the decontamination enclosure system immediately. Disposable clothing of the type worn inside the Work Area is not permitted outside the Work Area.

3.05 MAINTENANCE OF DECONTAMINATION ENCLOSURE FACILITIES AND BARRIERS

The following procedures shall be followed during abatement activities.

A. All polyethylene barriers inside the work place and partitions constructed to isolate the Work Area from occupied areas shall be inspected by the asbestos handler supervisor at least twice per shift.

B. Smoke tubes shall be used to test the integrity of the Work Area barriers and the decontamination enclosure systems daily before abatement activity begins and at the end of each shift.

C. Damage and defects in the decontamination enclosure system shall be repaired immediately upon discovery. The decontamination enclosure system shall be maintained in a clean and sanitary condition at all times.

D. At any time during the abatement activity, if visible emissions are observed, or elevated asbestos fiber counts outside the Work Area are measured, or if damage occurs to barriers, abatement shall stop. The source of the contamination shall be located, the integrity of the barriers shall be restored and extended to include the contaminated area, and visible residue shall be cleaned up using appropriate HEPA-vacuuming and wet cleaning.

E. Inspections and observations shall be documented in the daily project log by the asbestos handler supervisor.

F. The daily inspection to ensure that exits have been checked against exterior blockage or impediments to exiting shall be documented in the log book. If exits are found to be blocked, abatement activities shall stop until the blockage is cleared.

3.06 MODIFICATIONS TO HVAC SYSTEMS

A. Shut down, isolate or seal, all existing HVAC units, fans, exhaust fans, perimeter convection air units, supply and/or return air ducts, etc., situated in, traversing or servicing the work zone.

B. Seal all seams with duct tape. Wrap entire duct with a minimum of two layers of fire retardant 6-mil polyethylene sheeting. All shutdowns are to be coordinated with the Facility. Where systems must be maintained, i.e., traversing Work Areas to non-Work Areas, only supply ducts will be maintained, protect as described above. All returns must be blanked off in Work Area and adjacent areas, including floor above and below Work Area. When required Asbestos abatement contractor shall apply for a clarification from NYCDEP. The Asbestos abatement contractor shall implement the following engineering procedures:

1. Maintenance of a positive pressure within the HVAC system of 0.01 inch water gauge (or greater) with respect to the ambient pressure outside the Work Area. The conditions for this system shall be maintained and be operational 24 hours per day from the initiation of Work Area preparation until successful final air clearance. Positive pressurization of HVAC system shall be applied only under the direction and control of professional engineer, or other knowledgeable licensed professional;

2. The positive pressurization of the duct shall be tested, inspected and recorded both at the beginning and at the end of each shift;

3. The positive pressurization shall be monitored using instrumentation which will provide a written record of pressurization and that will trigger an audible alarm, if the static pressure falls below the set value;

4. The supply air fan and the supply air damper for the active positive-pressurized duct shall be placed in the manual "on" positions to prevent shutdown by fail-safe mechanisms;

5. The return air fan and the return air dampers shall be shut down and locked-out;

6. All the seams of the HVAC ducts that pass through the Work Area shall be sealed;

7. The HVAC ducts that pass through the Work Area shall be covered with two (2) layers of fire retardant 6-mil polyethylene sheeting, and all seams and edges of both layers shall be sealed airtight;

8. The supply air fans, return air fans, and all dampers servicing the Work Area itself shall be shut down and locked-out. All openings within the Work Area of supply and return air ducts shall be sealed with 3/8-inch fire rated plywood and two layers of fire retardant 6-mil polyethylene;

9. When abatement occurs during periods while the HVAC system is shut down an alternative method of pressurization of the duct passing through the Work Area should be employed (e.g., by low-pressure "blowers", etc., directly coupled into the duct). Item #4 above shall be deleted and shall be replaced by the requirement to set the dampers of the HVAC duct in the manual closed positions, in order to effect pressurization.

C. Asbestos abatement contractor to coordinate this item with the Facility and Construction Project Manager at the commencement of work. Where present HVAC systems (ducts) service an area and that air system cannot be shut down, asbestos abatement contractor shall isolate and seal the ducts, both supply and return, at the boundary of that zone.

1. To isolate, cap, or seal a duct, the asbestos abatement contractor shall remove insulation from duct (if necessary), then disconnect linkage to fold shut all fire dampers. Asbestos abatement contractor shall seal all edges and seams with caulk and duct-tape.

2. Asbestos abatement contractor shall then cut existing duct and fold metal in and secure with approved fasteners. Asbestos abatement contractor shall caulk and duct-tape all seams and edges.

3. All ducts shall then be completely wrapped and sealed with duct-tape and three (3) layers of reinforced polyethylene sheeting.

4. All ducts shall be restored to original working order at the end of the project.

D. Where present HVAC systems (ducts) service occupied areas (non-Work Areas), the Asbestos abatement contractor shall blank off the ducts.

1. To isolate or seal the return duct, the asbestos abatement contractor shall remove any insulation (if necessary) from the duct. Then disconnect linkage to fold shut all fire dampers and insert a fiberglass board within the duct. Asbestos abatement contractor shall seal all edges and seams with caulk, duct-tape and three (3) layers of reinforced polyethylene sheeting.

2. All isolation of return ducts and any other activity that requires removal of ceiling by the asbestos abatement contractor shall be conducted under controls. Work is to be coordinated with the Construction Project Manager and the Facility and is described as follows:

a. Work shall occur as scheduled.

b. Horizontal surfaces near the blanking operations shall be protected with fire retardant 6-mil polyethylene sheeting.

c. Plastic drapes shall be used to enclose the immediate area.

d. Asbestos abatement contractor to position and operate air filtration devices and HEPA-vacuums in the area to clean space after blanking operations.

e. All personnel involved with this work shall receive personal protection (i.e., respirators and disposable suits).

E. Upon loss of negative pressure or electric power, all work activities in an area shall cease immediately and shall not resume until negative pressure and/or electric power has been fully restored. When a power failure or loss of negative pressure lasts, or is expected to last, longer than thirty (30) minutes, the following sequence of events shall occur.

1. All make up air inlets shall be sealed airtight.

2. All decontamination facilities shall be sealed airtight after evacuation of all personnel from the Work Area.

3. All adjacent areas shall be monitored for potential fiber release upon discovery of and subsequently throughout, power failure.

3.07 LOCKOUT OF HVAC SYSTEMS, ELECTRIC POWER, AND ACTIVE BOILERS

Prior to the start of any prep work, the asbestos abatement contractor shall employ skilled tradesmen with limited asbestos licenses for the following work:

A. Disable all ventilating systems or other systems bringing air into or exhausting air out of the Work Area. Disable system by disconnecting wires removing circuit breakers, by lockable switch or other positive means to ensure against accidental re-starting of equipment.

B. Lock out power to the Work Area by switching off all breakers and removing them from panels or by switching and locking entire panel. Label panel with following notation: “DANGER CIRCUIT BEING WORKED ON”. Give all keys to Facility.

C. Lock out power to circuits running through Work Area whenever possible by switching off and removing breakers from panel. If circuits must remain live, the Facility shall notify asbestos abatement contractor in order that he may secure a variance from NYCDEP. The asbestos abatement contractor shall protect all conduit and wires to remain and label all active circuits at intervals not to exceed 3 feet with tags having the following notation: “DANGER LIVE ELECTROCUTION HAZARD”. The asbestos abatement contractor shall label all circuits in all locations including hidden locations that may be affected by the work in a similar manner.

D. All boilers and other equipment within the work area shall be shut down, locked out, tagged out and the burner/boiler/equipment accesses and openings shall be sealed until abatement activities are complete. If the boiler or other exhausted equipment will be subject to abatement, all breeching, stacks, columns, flues, shafts, and double-walled enclosures serving as exhausts or vents shall be segregated from the affected boiler or equipment and sealed airtight to eliminate potential chimney effects within the work area.

PART 4 – PREPARATION OF WORK AREA AND REMOVAL PROCEDURES

4.01 REMOVAL OF ASBESTOS-CONTAINING MATERIAL

A. Asbestos abatement contractor Responsibility

Asbestos abatement contractor shall be responsible for the proper removal of ACM from

the Work Area using standard industry techniques. The Third-Party Air Monitor representative shall observe the Work.

1. General Requirements:

   a. Removal of ACM shall be performed using wet methods. Dry removal of ACM is prohibited.

   b. Spray ACM with amended water with sufficient frequency and quantity to enhance penetration. Sufficient time shall be allowed for amended water to penetrate the material to the substrate prior to removal. All ACM shall be thoroughly wetted while work is being conducted.

   c. Accumulation of standing water on the floor of the Work Area is prohibited.

   d. Apply removal encapsulants, when used, in accordance with the manufacturer's recommendations and guidelines.

   e. Containerize ACM immediately upon detachment from the substrate. Alternately, ACM may be dropped in to a flexible catch basin and promptly bagged. Detached ACM is not permitted to lie on the floor for any period of time. Excess air within the bag shall be removed before sealing. ACM shall not be dropped from a height of greater than 10 feet. Above 10 feet, dust free inclined chutes may be used. Maximum inclination from horizontal shall be 60-degrees for all chutes.

   f. Exits from the work area shall be maintained, or alternative exits shall be established, in accordance with section 1027 of the New York City Fire Code. Exits shall be checked at the beginning and end of each work shift against blockage or impediments to exiting.

   g. Signs clearly indicating the direction of exits shall be maintained and prominently displayed within the work area.

   h. No smoking signs shall be maintained and prominently displayed within the work place.

   i. At least one fire extinguisher with a minimum rating 2-A:10-B:C shall be required for each work place. In the case of large asbestos projects, at least two such fire extinguishers shall be required.

j. If the containment area of an asbestos project covers the entire floor of the affected building, or an area greater than 15,000 square feet on any given floor, the installation of a negative air cut off switch or switches shall be required at a single location outside the work place, such as inside a stairwell, or at a secured location in the ground floor lobby when conditions warrant. The required switch or switches shall be installed by a licensed electrician pursuant to a permit issued by the Department of Buildings. If negative pressure ventilation equipment is used on multiple floors the cut off switch shall be able to turn off the equipment on all floors.

B. Removal of ACM Utilizing Full Containment Procedures shall be as follows:

1. Preparation Procedures:

a. Ensure that the Third-Party Air Monitor has performed area monitoring and established a background count prior to the preparatory operations for each removal area, as applicable.

b. Shut down, isolate, and lock out or tag heating, ventilating, and air conditioning (HVAC) systems which serve or which pass through the Work Area. Vents within the Work Area and seams in HVAC components shall be sealed with tape and two layers of fire retardant polyethylene sheeting. Filters in HVAC systems shall be removed and treated as asbestos contaminated waste.

c. Shut down, disconnect, and lock out or tag all electric power to the Work Area so that there is no possibility of its reactivation until after clearance testing of the Work Area.

d. Provide and install decontamination enclosure systems in accordance with Sections 3.01 and 3.02 of this Section.

e. Remove ACM that may be disturbed by the erection of partitions using tent procedures and wet removal methods. Removal shall be limited to a one-foot wide strip running the length/height of the partition.

f. Pre-clean and remove moveable objects from the Work Area. Pre-cleaning shall be accomplished using HEPA-vacuum and wet-cleaning techniques. Store moveable objects at a location determined by the City.

g. Protect carpeting that will remain in the Work Area.

(1) Pre-clean carpeting utilizing wet-cleaning techniques.

(2) Install a minimum of two layers of fire retardant 6-mil reinforced polyethylene sheeting over carpeting.

(3) Place a rigid flooring material, minimum thickness of 3/8-inch, over polyethylene sheeting.

h. Pre-clean all fixed objects to remain within the Work Area using HEPA-vacuum and wet-cleaning techniques.

i. Seal fixed objects with two individual layers, minimum, of 6-mil fire retardant polyethylene sheeting.

j. Pre-clean entire Work Area utilizing HEPA-vacuum and wet-cleaning techniques. Methods of cleaning that raise dust; such as dry sweeping or use of vacuum equipment not equipped with HEPA-filters, is prohibited.

k. Install isolation barriers (i.e., sealing of all openings, including but not limited to windows, corridors, doorways, skylights, ducts, grills, diffusers, and other penetrations within the Work Area) using two layers of 6-mil fire retardant polyethylene sheeting and duct-tape.

l. Construct rigid framework to support Work Area barriers.

(1) Framework shall be constructed using 2-inch by 4-inch wooden or metal studs placed 16 inch on center when existing walls and/or ceiling do not exist for all openings greater than 32 square feet. Framework is not required except where one dimension is one foot or less or the opening will be used as an emergency exit.

(2) Apply a solid construction material, minimum thickness of 3/8-inch to the Work Area side of the framing. In secure interior areas, not subject to access from the public or building occupants, an additional layer of 6-mil fire retardant polyethylene sheeting may be substituted for the rigid construction material.

(3) Caulk all wall, floor, ceiling, and fixture joints to form a leak tight seal.

m. Seal floor drains, sumps, shower tubs, and other collection devices with two layers of 6-mil fire retardant plastic and fire rated plywood,

as necessary, and provide a system to collect all water used by the asbestos abatement contractor. Collected water shall be passed through a water filtration system prior to being discharged into the sanitary sewer.

n. Remove ceiling mounted objects not previously sealed that will interfere with removal operations. Mist object and surrounding ACM with amended water prior to removal to minimize fiber dispersal. Clean all moveable objects using HEPA-vacuum and wet-cleaning techniques prior to removal from the Work Area.

o. Fiberglass insulation with intact coverings shall be protected in place during abatement activities. These materials shall be protected with two layers of 6-mil fire retardant polyethylene sheeting as isolation barriers and two additional layers of 6-mil fire retardant polyethylene sheeting serving as primary and secondary surface barriers.

p. Install and initiate operation of Air Filtration Devices (AFD)s to provide a negative pressure and a minimum of four air changes per hour within the Work Area relative to surrounding non-Work Areas. Do not shut down AFDs until the Work Area is released to the City following final clearance procedures. The use of HEPA-filtered vacuum to produce a negative air pressure inside the enclosure is prohibited.

q. Maintain emergency and fire exits from the Work Area or establish alternative exits satisfactory to the local fire officials. Emergency exits and routes shall be established and clearly marked with florescent paint or other effective designations to permit easy location from anywhere within the Work Area. Cutting tools (e.g., knife, razor) shall be attached to the work area side of the sheeting for use in the event that the barrier must be cut open to allow egress. Emergency exits shall be secured to prevent access from uncontaminated areas and yet permit emergency exiting. Exits shall be checked daily against exterior blockage or impediments to exiting.

r. Temporary lighting within the Work Area and decontamination system shall be provided as required to achieve minimum illumination levels.

s. Hand power tools used to drill, cut into, or otherwise disturb ACM shall be manufacturer-equipped with HEPA filtered local exhaust ventilation.

t. Prior to being plasticized, the Work Areas shall be cleaned using

HEPA vacuum equipment and/or wet cleaning methods as appropriate. Methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters, shall not be used.

u. Plasticize the area after pre-cleaning, using the following procedures.

(1) Cover floors with one layer of 6-mil fire retardant polyethylene sheeting, turning layer a minimum of 6 inches up wall, and seal layer to wall.

(2) Cover walls with one layer of 6-mil fire retardant polyethylene sheeting, overlapping wall layer a minimum of 6 inches, and seal layer to floor layer.

(3) Cover floors with a second layer of 6-mil fire retardant polyethylene sheeting, turning layer a minimum of 12 inches up wall, and seal layer to wall.

(4) Cover walls with a second layer of fire retardant 6-mil polyethylene sheeting, overlapping wall layer a minimum of 12 inches, and seal layer to floor layer.

(5) In areas where demolition is required to access ACM, a layer of fire retardant 6-mil reinforced polyethylene sheeting shall be placed on the floor of the enclosure.

(6) Perform demolition required to access ACM. Debris resulting from demolition activities shall be disposed of as ACM waste as described in this Specification.

(7) Repeat preparation of areas accessed by demolition activities as described above.

v. Suspended ceiling tiles and T-grid components shall remain in place until the preparation of the Work Area below the ceiling tiles are completed and personnel and equipment decontamination enclosures have been constructed.

w. Scaffolds shall be provided for workers engaged in work that cannot safely be performed from the ground or other solid Work Area surface.

x. Means of egress shall not be obstructed by hardwall barriers.

y. Pre-Removal Inspections.

(1) Prior to removal of any ACM, the asbestos abatement contractor shall notify the Third-Party Air Monitor and request a pre-removal inspection. Posting of warning signs, building of decontamination enclosure systems, and all other preparatory steps have been taken prior to notification of the Third-Party Air Monitor.

(2) Asbestos abatement contractor shall correct any deficiencies observed by Third-Party Air Monitor at no additional cost to City.

(3) Following the Third-Party Air Monitor's approval of the Work Area preparations, removal of ACM may commence.

2. Removal of ACM Within Full Containment:

a. Mist material with amended water. Allow sufficient time for the amended water to penetrate the material to be removed.

b. Remove the material using hand tools such as scrapers or putty knives. Wire-mesh or wood lathe reinforcing, when present, shall be cut into manageable pieces and disposed of as ACM.

c. Remove any residual material from the substrate using wet cleaning methods and nylon-bristled hand brushes.

d. Place the removal material immediately into a properly labeled fire retardant 6-mil polyethylene bag. All material shall be properly containerized and decontaminated prior to removal from the Work Area.

e. Following the completion of removal of insulation, all visible residue shall be removed from the substrate.

3. Following Removal of ACM utilizing Full Containment Procedures:

a. First Cleaning:

(1) Remove any visible accumulation of asbestos material and debris. HEPA-vacuuming and wet cleaning shall be performed on all surfaces inside the Work Area. All sealed drums, plastic bags, and equipment used in the Work Area shall be removed from the Work Area.

(2) Upon request of the asbestos abatement contractor, the Third-Party Air Monitor will perform a visual inspection. Evidence of asbestos contamination identified during the inspection will necessitate further cleaning as heretofore specified.

(3) Remove first layer of plastic sheathing inside the Work Area. The isolation barriers and decontamination facility shall remain in place and be utilized.

b. Second Cleaning:

(1) After the first cleaning, the Work Area shall be vacated for twelve hours to allow fibers to settle.

(2) All objects and surfaces in the Work Area shall be HEPA - vacuumed and wet cleaned for a second cleaning.

(3) A thin coat of lockdown encapsulant shall be applied to all plastic covered surfaces in the Work Area.

(4) When the encapsulant is dry, second layer of polyethylene sheeting on the walls, ceiling and floors shall be removed. Do not remove seals from doors, windows, Isolation Barriers or disconnect the negative pressure equipment.

c. Third Cleaning:

(1) A minimum of four hours after the second cleaning, all the surfaces in the Work Area shall be HEPA-vacuumed and wet cleaned for a third cleaning.

(2) Upon the request of the asbestos abatement contractor, the Third-Party Air Monitor will do final visual inspection for re-occupancy. Evidence of asbestos contamination identified during the inspection will necessitate further cleaning as heretofore specified.

(3) When the Work Area passes the Third-Party Air Monitor's visual re-occupancy inspection, air sampling shall not begin until at least one hour after the completion of the third cleaning. The Third-Party Air Monitor shall perform air monitoring using aggressive testing techniques. The Third-Party Air Monitor will approve re-occupancy if the specified fiber count in the Work Area is achieved according to the Third-Party Air Monitor.

(4) When the Work Area passes the re-occupancy test, all controls and seals established shall be removed.

(5) The cleaned layer of the surface barriers shall be removed from walls and floors.

(6) The isolation barriers shall remain in place throughout cleanup. Decontamination enclosure systems shall remain in place and be utilized. A thin coat of lockdown encapsulant shall be applied to all surfaces in the work area which were not the subject of removal or abatement, including the cleaned layer of the surface barriers, but excepting sprinklers, standpipes, and other active elements of the fire suppression system.

d. Final Barrier Removal:

(1) Upon receipt of acceptable clearance testing results, polyethylene sheeting and Isolation Barriers shall be removed and disposed accordingly as asbestos-containing material.

(2) The area surrounding the abatement work place shall be cleaned of any visible debris utilizing HEPA vacuum and wet methods.

e. The Third-Party Air Monitor will conduct a final visual observation. Approval must be granted prior to break down of decontamination facility and asbestos abatement contractor demobilization.

4.02 MAINTENANCE OF CONTAINED WORK AREA AND DECONTAMINATION ENCLOSURE SYSTEMS

A. Ensure that barriers are installed in a manner appropriate to the expected weather conditions during the project and for its duration. Repair damaged barriers and remedy defects immediately upon their discovery. Visually inspect barriers at the beginning and end of each work period.

B. Visually inspect non-Work Areas and the decontamination enclosure system for water leakage. Check the floor below, ceiling and walls, and view beneath/or around the decontamination enclosure system, for signs of leakage. Perform the visual inspection a minimum of two times for each 8-hour work shift.

PART 5 – ASBESTOS WASTE MANAGEMENT

5.01 ACM WASTE REQUIREMENTS

A. The asbestos abatement contractor and all sub-asbestos abatement contractors are

specifically alerted to the illegal practice of combining asbestos-containing waste (ACW) from one project with the ACW of other projects without using the services of a permitted waste transfer station as defined by 6 NYCRR Part 360 and 364. As part of the shop drawing submittals, the asbestos abatement contractor must submit for approval the proposed method of transportation and disposal that will be utilized to manage the ACW of this Contract. If a permitted transfer station is to be used, the cost shall be included in the work. The asbestos abatement contractor must submit a waste manifest consistent with whatever approved method is utilized as part of the invoicing and payment procedures.

B. The asbestos abatement contractor shall maintain compliance with the strictest set of regulations of Title 15, Chapter 1 of RCNY, NYC LL 70/85, NYS DOL ICR 56, USEPA, Asbestos Regulation 40 CFR Section 61.152, 29 CFR 1926.1101, 29 CFR 1910.1200 (F) of OSHA's Hazard Communication Standards, and other applicable standards.

NOTE: Any penalties incurred for failure to comply with any of the above regulations will be the sole responsibility for fines imposed due to negligence of the Asbestos abatement contractor.

C. When presenting ACW for storage at the generation site, the asbestos abatement contractor shall:

1. Wet down ACW in a manner sufficient to prevent all visible emissions of dust into the air.

2. Seal material in a leak tight container while wet.

3. Keep ACW separate from any other waste.

D. When presenting ACW for storage away from the site of generation, the Asbestos abatement contractor shall:

1. Ensure that ACW has been properly packaged as per requirements above.

2. Examine the containers of ACW to ensure that there are no breaks in the containers and that no visible dust is being released into the air.

3. If examination reveals damage to a container of ACW the Asbestos abatement contractor or person accepting the waste shall immediately wet down the ACW and repackage it into a clean leak tight container. The subsequent repackaging shall be the financial responsibility of the Asbestos abatement contractor and occur at no extra cost to the City.

4. Keep ACW separate from any other waste.

E. When storing ACW – The Asbestos abatement contractor shall:

1. Ensure that the ACW has been sufficiently wetted down in tight containers.

2. Re-wet and repackage any damaged containers.

3. Maintain at storage site an adequate supply of spare leak tight containers.

4. Maintain at storage site an adequate supply of amended water.

5. Keep ACW separate from any other waste.

6. Keep ACW in a secured, enclosed, and locked container.

7. If the asbestos abatement contractor has intention of sorting a quantity of ACW greater than or equal to 50 cubic yards, the Asbestos abatement contractor shall:

   a. Submit a written request and receive written approval from the City.

F. When presenting for transport, the asbestos abatement contractor shall:

1. Ensure that ACW has been sufficiently wetted down.

2. Examine the integrity of the container's airtight seal.

3. Re-wet and repackage any damaged containers.

4. Keep ACW separate from all other waste.

5. Ensure that a person transporting asbestos waste holds a valid permit issued pursuant to law.

6. Frequency of Waste Removal:

   a. Properly packaged and labeled asbestos waste shall be removed from the site on a daily basis. Under no circumstance shall asbestos waste be stored on site without written approval from the City. The Waste Hauler and landfill shall be as indicated on the notifications to regulatory agencies.

G. Waste Load-out Through Equipment Decontamination Enclosure (Full Decontamination Facility): Place asbestos waste in disposal bags. Large items not able to fit into disposal bags shall be wrapped in one layer of 6-mil thick polyethylene sheeting. Clean outer covering of asbestos waste package by wet cleaning and/or HEPA-vacuuming in a designated part of the Work Area. Move wrapped asbestos waste to the equipment washroom, wet clean each bag or object and place it inside a second disposal bag, or a second layer of 6-mil polyethylene sheeting, as the item's physical characteristics demand. Air volume shall be minimized, and the bags or sheeting shall be sealed airtight with tape.

1. The clean containerized items shall be moved to the equipment decontamination enclosure holding area pending load-out to storage or disposal facilities.

2. Workers who have entered the equipment decontamination enclosure system from the uncontaminated non-Work Area shall perform load-out of containers from the decontamination enclosure holding area. Dress workers moving asbestos waste to storage or disposal facilities in clean overalls of a color different than from that of coveralls used in the Work Area. Ensure that workers do not enter from uncontaminated areas into the equipment washroom or the Work Area. Ensure that contaminated workers do not exit the Work Area through the equipment decontamination enclosure system.

3. Thoroughly clean the equipment decontamination enclosure system immediately upon completion of the waste load-out activities, and at the completion of each work shift.

4. Labeled ACM waste containers or bags shall not be used for non-ACM debris or trash. Any materials placed in labeled containers or bags, including those turned “inside-out”, shall be handled and disposed of as ACM waste.

H. All asbestos materials, wastes, shower water, polyethylene, disposable equipment and supplies shall be disposed of as asbestos contaminated waste, in accordance with the EPA regulation (40 CFR, Section 61.150) and those requirements of the New York Department of Environmental Conservation and New York City Department of Sanitation.

I. All asbestos materials shall be prepared for transportation in accordance with this specification and all applicable Federal, State, County and City Regulations. asbestos abatement contractor shall submit the following documentation:

1. Where applicable, an EPA Generator's identification number which has been obtained from the EPA for all asbestos waste generated from the project.

2. Applicable State Waste Hauler license and registration numbers.

3. Federal Hazardous Materials Waste Hauler number.

4. Designated landfill EPA Permit numbers.

J. Prior to loading asbestos waste the enclosed cargo areas (dumpster) shall be prepared as follows:

1. Clean via HEPA-vacuum and wet wipe techniques the enclosed cargo areas of all visible debris prior to preparing with polyethylene.

2. Line the cargo area with two layers of 6-mil polyethylene sheeting to prevent contamination from damaged or leaking containers. Floor sheeting shall be installed first and extend up the walls a minimum of 24-inches. Wall sheeting shall be overlapped and taped securely into place.

K. Asbestos-containing waste shall be placed on level surfaces in the cargo area of the dumpster and shall be packed tightly to prevent any shifting or tipping of the waste during transportation.

L. Asbestos-containing waste shall not be thrown into or dropped from the dumpster. All material shall be handled carefully to prevent rupture of the containers.

M. All personnel engaged in handling and loading of asbestos contaminated waste outside of the Work Area shall wear protective clothing. The disposable clothing shall include head, body and foot protection and color of clothing shall be different from abatement personnel in the Work Area. Minimum respiratory protection shall be half face, dual cartridge, air purifying respirators with HEPA-filters.

N. Asbestos abatement contractor shall immediately clean debris or residue observed on containers or surfaces outside of the Work Area. Cleaning shall be via HEPA equipped wet/dry vacuums only.

O. All asbestos-containing waste shall be transported from the abatement site to the landfill by a registered Waste Hauler. When transporting ACW:

1. Ensure that the ACW has been sufficiently wetted down in a leak tight container.

2. Re-wet and repackage any damaged containers.

3. Maintain at storage site an adequate supply of spare leak tight containers.

4. Maintain at storage site an adequate supply of amended water.

5. Keep ACW separate from any other waste.

P. Keep ACW in a secured, enclosed, and locked container.

Q. Waste transport documents shall conform to the requirements of the U.S. Department of Transportation, Hazardous Materials Transportation Regulation, 49 CFR Part 173 and EPA 40 CFR 61.150 (d)(1)(2). Shipping documents shall be clearly marked with the required designation "RQ Asbestos". Asbestos abatement contractor shall provide a copy of this document to the City.

R. A uniform hazardous waste manifest shall be prepared by the asbestos abatement contractor and signed by the asbestos abatement contractor each time the asbestos abatement contractor ships a dumpster load of Asbestos-Containing Waste Material. The uniform hazardous waste manifest shall include the site of waste generation, the names and addresses of the Transporter, the asbestos abatement contractor, and the landfill operator with information on the type and number of asbestos-waste containers, time and date. Asbestos abatement contractor shall provide the Construction Project Manager, Third-Party Air Monitor or authorized designated representative with signed copies of the waste manifest before each departure.

S. Asbestos abatement contractor or his/her Waste Hauler shall transport asbestos-containing waste material from the abatement site directly to the specified disposal site. Asbestos abatement contractor or their Waste Hauler shall not accept material from any other site when transporting asbestos-containing waste material from the abatement site. The authorized DDC representative or Construction Project Manager reserves the right to travel with asbestos abatement contractor’s Waste Hauler to the waste disposal site. No intermediate storage of waste material (i.e., asbestos abatement contractor’s warehouse) shall be permitted.

T. Final or progress application for payments will not be processed unless all hazardous waste manifests generated to date have been received and reviewed by the Construction Project Manager.

U. All asbestos materials, wastes, shower water, polyethylene disposable equipment and supplies shall be disposed of as asbestos contaminated waste, in accordance with the EPA regulation (40 CFR, Section 61.150) and those requirements of the New York State Department of Environmental Conservation and the New York Department of Sanitation.

V. Asbestos abatement contractor shall transport all sealed drums to a landfill disposal site approved by the Department of Environmental Conservation and the EPA. Transportation shall be performed by a New York State registered Waste Hauler, where required. When presenting the ACW for disposal the Asbestos abatement contractor or sub Asbestos abatement contractor shall:

1. Ensure that waste container is properly labeled according to the National Emission Standard for Hazardous Air Pollutants (NESHAP); Asbestos Revision, 40 CFR, Part 61, Subpart M. The labels shall include the name of the waste generator and the location where the waste was generated.

2. Comply with all applicable orders issued pursuant to asbestos disposal.

3. Ensure that ACW has been sufficiently wetted down.

4. Re-wet and repackage any damaged containers.

5. Keep ACW separate from all other wastes.

W. Asbestos abatement contractor shall notify the waste disposal site, at least 24 hours prior to transportation of asbestos contaminated waste to be delivered. Asbestos abatement contractor shall determine if a larger notification period is required.

X. At the site asbestos abatement contractors or Waste Hauler trucks shall approach the dump location as close as possible for unloading asbestos waste. Containers shall be carefully placed in the ground. Do not throw containers from truck.

Y. Asbestos abatement contractor or Waste Hauler shall inspect containers as they are unloaded at the disposal site. Material in damaged containers shall be repacked in empty containers, as necessary.

Z. Asbestos abatement contractor or Waste Hauler shall not remove asbestos-containing waste Material from drums unless required to do so by the disposal site City. Used drums shall be disposed of as asbestos-asbestos contaminated waste.

AA. All personnel engaged in unloading of the containers at the waste site shall wear protective clothing. The disposable clothing shall include head, body and foot protection. Minimum respiratory protection shall be half face, dual cartridge, air purifying respirators with HEPA-filters. Workers shall remove their protective clothing at the disposal site, place it in labeled disposal bags and leave them with the deposited waste shipment.

BB. For the compaction operation, the asbestos abatement contractor shall ensure that disposal sites personnel have been provided with personal protective equipment by the disposal operator. If the disposal site City has not provided this protective equipment, the asbestos abatement contractor shall supply protective clothing and respiratory protection for the duration of this operation (PAPR respirators are mandatory).

CC. If containers are broken or damaged, the asbestos abatement contractor or Waste Hauler shall, using personnel who are properly trained and wearing proper protective equipment, shall repackage the waste in properly labeled containers. Asbestos abatement contractor shall then clean the entire truck and its contents using HEPA-vacuums and wet cleaning techniques until no visible residue is observed.

DD. Following the removal of all containerized waste, the asbestos abatement contractor shall decontaminate the truck cargo area using HEPA-vacuums and/or wet cleaning techniques until no residue is observed. All 6-mil polyethylene sheeting shall be removed and discarded as asbestos-containing waste material along with contaminated cleaning material and protective clothing, in containers at the disposal site.

EE. The transporter(s) of all asbestos waste shall not back-haul any items on his return from landfill/disposal site.

FF. All asbestos waste shall be disposed of in an approved Asbestos Landfill site only.

1. NO PERSON UNDER ANY CIRCUMSTANCES SHALL ABANDON ACW. The same shall be disposed of only by certified persons in approved landfills.

2. A manifest form will be signed by the Landfill documenting receipt and acceptance of the asbestos-containing waste. This manifest will be furnished to the City of New York within thirty calendar days from the project completion date.

3. It is the responsibility of the Asbestos abatement contractor to determine current waste handling, transportation and disposal regulations for the work site and for each waste disposal landfill. The Asbestos abatement contractor must comply fully with these regulations and all appropriate U.S. Department of Transportation, EPA and other Federal, State and Local entities' regulations and all other current legal requirements.

4. The asbestos abatement contractor shall obtain an agreement from the transporter (s) that the practice of "Back-Hauling" will not be engaged in, with respect to any and all waste loads taken from this site during the work.

5. The asbestos abatement contractor will document actual disposal of the waste at the designated landfill by having completed a Disposal Certificate and will provide a copy of the same to the Department of Design and Construction.

PART 6 – ACCEPTANCE

6.01 ACCEPTANCE

Upon satisfactory completion of all decontamination procedures, a certificate will be issued by the Construction Project Manager with copies to all parties.

A. A letter of Compliance stating that all the work on the project was performed in accordance with the Specifications and all applicable Federal, State and Local regulations.

B. All warranties as stated in the Specifications.

END OF SECTION 02 82 13

SECTION 02 83 19

LEAD-BASED PAINT WORK PROCEDURES

PART 1 – GENERAL

1.01 DESCRIPTION

A. Lead Based Paint Work Procedures (LBPWP) refers to preventative measures that shall be undertaken by the Abatement Contractor to prevent exposure of current or future building occupants, their belongings, and the Abatement Contractor's workers, to lead contaminated dust, paint chips and debris during the course of the Abatement Contractor's work activities within a child occupied building.

B. This specification details areas where Lead-Based Paint (LBP) may be impacted during the renovation project and will require specific preventive dust control measures to be employed. The Abatement Contractor shall furnish all labor, materials, services, training, insurance, and equipment as needed to limit the potential exposure to LBP during construction renovation activities. The Abatement Contractor shall follow all Federal, State, and local ordinances, regulations and rules pertaining to LBP, including its storage, transportation, and disposal.

C. The following documents were reviewed and utilized to generate this abatement design specification which serves to locate and quantify the amount of lead-based paint (LBP) to be removed and/or stabilized in support of this project.

1. Final Report of Lead-Based Paint (LBP) Survey Services – Astoria Branch Library ADA Upgrade, 14-01 Astoria Boulevard, Queens, NY 11102, prepared by: LiRo Engineers Inc, Dated 08/28/2018.

2. 100% Construction Documents Submission set of drawings dated 04/29/22. Prepared by Yoshihara McKee Architect P.C.

D. The phasing and scheduling of work for this project shall be coordinated with and approved by the Construction Project Manager and Facility Manager. The Construction Project Manager and Facility Manager will make the final determination on all issues under this Contract covered by this Specification.

1.02 SCOPE OF WORK

A. The following procedures shall apply to all activities that disturb building material and cause, or have potential to cause, dusts, chips, or other construction-related debris:

1. Removal of LBP (Non-Metal surfaces): removal of entire painted surface within the work area(s), including loose peeling, chipping and rust damage as well as intact LBP.

2. Removal of LBP (Metal surfaces): The removal of LBP from metal surfaces shall follow the Society of Protective Coatings (SSPC) specifications.

B. This specification includes the requirements for the LBPWP of specific building components that have been tested and/or otherwise determined to be covered with lead-based paint.

C. The Abatement Contractor is responsible to implement LBPWP for the removal and/or stabilization and disposal of the following Lead Based Paint at:

1. LBP from Lower Level (Basement), as follows: Wall Plaster (Yellow) (2,680 sq.ft.), Wall Plaster (White) (40 sq.ft.), Ceiling Plaster (White) & Ceiling Beam Plaster (White) (2,000 sq.ft.), Ceiling Plaster (White) (280 sq.ft.),Shelving Wood (Brown) (150 sq.ft.) Dumb Waiter Door Wood (Yellow) (6 sq.ft.), Dumb Waiter Door Frame Wood (Yellow) (10 sq.ft.), Wall Concrete (White) (320 sq.ft.),Ceiling Concrete (White) (510 sq.ft.), Wall Concrete (Yellow) (595 sq.ft.), and HVAC Support Metal (Yellow) (30 sq.ft.).

2. LBP from Upper Level (First Floor), as follows: Wall Plaster (Yellow) (4,350 sq.ft.), Wall Plaster (Beige) (100 sq.ft.), Ceiling Plaster (White) (1,281 sq.ft.), Ceiling Plaster (Beige) (4 sq.ft.), Vent Cover Metal (Beige) (2 sq.ft.), Electrical Panel Metal (Beige) (15 sq.ft.), Steel Column Metal (Yellow) (80 sq.ft.).

3. LBP from Mezzanine Level, as follows: Wall Plaster (Yellow) (750 sq.ft.), Ceiling Plaster (White) (600 sq.ft.) and Door Frame Wood (Yellow) (10 sq.ft.).

4. LBP from Stair Well (Lower, Upper and Mezzanine Levels), as follows: Wall Plaster (Yellow) (650 sq.ft.), Ceiling Plaster (White) (160 sq.ft.), Ceiling Header Plaster (White) (120 sq.ft.), Stringer Metal (Black) (80 sq.ft.), Stair Riser Metal (Black) (120 sq.ft.), Post Metal (Black) (36 sq.ft.), Baluster Metal (Black) (40 sq.ft.) and Hand Rail Support Metal (Black) (10 sq.ft.).

D. The Abatement Contractor shall remove and/or stabilize lead-based paint by one or more of the following methods, subject to compliance with requirements and systems specified herein:

1. Hand Tools

2. Power Tools

3. Chemical Stripping

E. The Abatement Contractor shall not perform the following activities on painted surfaces: dry scraping, dry sanding, open-flame removal, or on-site methylene chloride stripping. Other prohibited activities shall include, but not be limited to, dry sweeping of dust, paint chips or debris, storage of debris, building components, or equipment in a manner inconsistent with all applicable waste regulations, or the use of standard shop or household vacuums for the removal of dust or debris.

F. Paint removal and/or stabilization methods shall be environmentally safe, and they shall be non-caustic unless otherwise approved in writing by the Construction Project Manager and Facility Manager. Procedures shall be effective without causing damage to any substrates.

Attached to these specifications are the following drawings:

- LR-01 Lead Removal General Notes
- LR-02 Lead Removal Lower Level (Basement) Plan
- LR-03 Lead Removal Upper Level (First Floor) Plan
- LR-04 Lead Removal Mezzanine Plan
- LR-05 Lead Removal Stair Case Plans

G. This Facility is under the jurisdiction of the Queens Public Library. The phases and hours intended for the scheduling of the work shall be coordinated with the Construction Project Manager and Facility Manager. Unless indicated elsewhere in these specifications, all work shall be accomplished during regular working hours. It is the Abatement Contractor's responsibility to plan and schedule the work of this Contract with the approval and consent of the Construction Project Manager and Facility Manager.

H. All demolition, stabilization and removal work and all other work which may create lead contaminated dust, paint chips or debris shall be performed in accordance with all applicable regulations and guidelines including but not limited to:

1. New York State Department of Environmental Conservation 6 NYCRR Subparts 364, 371-376

2. Code of Federal Regulations (CFR) Publications:

   a. 29 CFR Part 1926.62 Lead Exposure in Construction; Final Rule Vol. 58, No. 84
   b. 29 CFR Part 1910.132(d) Hazard Assessment and Equipment Selection
   c. 40 CFR 61.01 Subpart A General Provisions (Hazardous Air Pollutants Listing)
   d. 40 CFR 61.152 (Standard for Waste Manufacturing, Demolition, Renovation, Spraying and Fabricating Operations)
   e. 40 CFR 241 (Guidelines for the Land Disposal of Solid Waste)
   f. 40 CFR 257 Criteria for Classification of Solid Waste disposal facilities and practices
   g. 40 CFR Subchapter 1 Solid Wastes (Parts 261 – 268)
   h. 40 CFR Part 745, Lead-Based Paint Poisoning Prevention in Certain Residential Structures
   i. Title X – Residential Lead Based Paint Hazard Reduction Act of 1992

3. American National Standards Institute ANSI Publications
   Z88.2-80 Practices for Respiratory Protection
   Z87.1 Occupational and Educational Personal Eye and Face Protection Devises

4. New York City Local Law 1/2004

I. Prior to starting, the Abatement Contractor must notify the Commissioner of the Department of Design and Construction if he/she anticipates any difficulty in performing the work as directed and required by these Specifications.

J. The Abatement Contractor will be required to attend an on-site job meeting with the Construction Project Manager and Facility Manager prior to start of work to examine the conditions of the site and the components in which LBP is being removed and/or stabilized to determine the method of LBP removal and/or stabilization and plan the sequence for removal/stabilization operations. Specifically, the relocation of building occupants during the execution of work must be coordinated with the Facility Manager and Construction Project Manager.

1.03 GUARANTEE

A. Work performed in compliance with this Contract shall be guaranteed for a period of one year from the date the completed work is accepted by the Department of Design and Construction.

B. The Abatement Contractor shall not be held liable for the guarantee where the repair required under the guarantee is a result of obvious abuse or vandalism, as determined by the

Commissioner.

C. The Commissioner of the Department of Design and Construction will notify the Abatement Contractor in writing regarding defects in work under the guarantee.

1.04 SPECIAL EXPERIENCE REQUIREMENTS FOR LEAD BASED PAINT ABATEMENT CONTRACTOR

A. Prior to starting the Work submit the following to the Construction Project Manager and the Office of Environmental/Hazmat, Geotechnical & Land Surveying (OEHS) for approval:

1. The Abatement Contractor (firm) must be licensed by the US Environmental Protection Agency (EPA) in accordance with 40 CFR Part 745.226 and Toxic Substance Control ACT (TSCA) Section 402(a)(1) to conduct lead-based paint activities.

2. The Abatement Contractor personnel must have valid NY lead-based paint professional worker and/ or supervisor certificates issued by the USEPA and OSHA 10-hour Construction Safety Certificates. A list of the proposed workers and supervisors and a copy of their USEPA certificates must be submitted prior to the work.

3. The Abatement Contractor's personnel must be trained in the requirements of NYC Local Law 1 Childhood Lead Poisoning Prevention Act of 2003 and by OSHA 1926.62 Lead Standard.

4. The Abatement Contractor performing the work of this section must demonstrate that they have been in the business of performing lead-based paint abatement work for the past three years. During that three (3) year period, the Abatement Contractor must have successfully completed in a timely fashion at least five projects similar in scope, size, and complexity to the required work (i.e., lead abatement projects using the techniques specified in this Contract).

5. For each project submitted to meet the experience requirements set forth in item # "4" above, the Abatement Contractor must provide the information set forth below for each project.

   a. Name of Abatement Contractor
   b. Name and location of the project
   c. Name, title and telephone number of the Owner or an Owner's representative who is familiar with the Bidders work on the project
   d. Brief description of the work completed
   e. Indicate whether the work was performed as a prime or a Sub Abatement Contractor
   f. Amount of the Contract or sub-Contract
   g. Date of completion

6. The Abatement Contractor must submit the name and current certifications of the environmental consulting and/or laboratory entity performing the OSHA personnel exposure monitoring for the Abatement Contractor. Such firm must be accredited by the American Industrial Hygiene Association (AIHA) and the New York State Department of Health Environmental Laboratory Approval Program (ELAP).

B. COMPLIANCE WITH EXPERIENCE REQUIREMENTS:

1. The Abatement Contractor is advised that no Sub-Contractor will be approved for

the performance of lead work hereunder unless the Abatement Contractor demonstrates compliance with the experience requirements set forth above. Compliance with such experience requirements will be determined by the City.

2. In the event the Bidder is a joint venture, at least one firm in the joint venture must meet the above-described requirements.

3. Insurance Requirements: The Abatement Contractor must provide insurance in the following amounts: 1 million dollars per occurrence, 2 million dollars aggregate (combine single limit). The City of New York shall be named as an additional insured on such insurance policy.

1.05 SITE INVESTIGATION

A. The Abatement Contractor will review all the Specifications, drawings and will investigate and confirm the Conditions affecting the work, including but not limited to:

1. The physical considerations and conditions of both the material and structure. These considerations include any obstacles or obstruction encountered in accessing or removing the material.

2. The exact quantity, age, and condition of the building components to be abated or disturbed.

3. The availability of qualified and skilled labor.

4. The availability of utilities.

5. The handling, storage, transportation, and disposal of the material.

6. Be familiar and comply with all applicable Local, State, Federal rules and regulations related to Lead Based Paint remediation.

1.06 WORK BY OTHERS

The Department of Design and Construction reserves the right during the term of this Contract to have work performed on other projects by other Abatement Contractors, and/or their own shop mechanics as circumstances warrant.

1.07 OCCUPANCY OF SITE NOT EXCLUSIVE

Attention is specifically drawn to the fact that Abatement Contractors, performing the work of other Contracts, may be brought upon any of the work sites of this Contract. Therefore, the Abatement Contractor shall not have exclusive rights to any site of his work and shall fully cooperate and coordinate his work with the work of other Abatement Contractors who may be brought upon any site of the work of this Contract.

1.08 SCAFFOLDING

The Abatement Contractor shall furnish all labor, scaffolding, platforms, transportation, tools, materials, employee training, services, fees, insurance and equipment necessary to carry out all phases of LBP procedures, decontamination operations and disposal in accordance with the United States Environmental Protection Agency (USEPA), the United States Occupation Safety and Health Administration (OSHA), the New York State Department of Environmental

Conservation (NYSDEC), the New York City Local Law 52 and all other applicable Federal, State and local government regulations in addition to these specifications.

1.09 TELEPHONE PAGING DEVICE

The Abatement Contractor or his authorized representative shall, at all times during the normal workday or during periods of overtime work under this Contract, carry a cellular smart telephone with email photograph capability. He/she shall supply to the Department of Design and Construction with the activation number for the device and he is liable to respond back to the calls from DDC within the next one (1) hour period after he receives the calls from DDC. The cost to the Abatement Contractor for this device and all charges accruing thereto is deemed included in the Bid.

1.10 PROTECTIVE EQUIPMENT FOR CONSTRUCTION PROJECT MANAGER

In addition to personal protective equipment for lead abatement workers, the Abatement Contractor shall make available at each worksite at least four (4) additional disposable coveralls each day for personnel who are authorized to inspect the work site. He/she shall also provide, for the duration of the work at any site involving a decontamination unit for worksite access, a lockable storage locker for use by the Construction Project Manager.

1.11 PROTECTION MEASURES

The project requires the removal, as defined in Section 1.02A.2 of this specification or Stabilization, as defined in Section 1.02A.1 of this specification of lead-based paint from interior textured plaster ceiling, interior metal radiator and exterior concrete wall. Abatement Contractor is responsible to close all windows and doors that are located inside and adjacent to each Work Area. All windows within 25 feet of the working surfaces shall be kept closed, including the windows of adjacent structures. Moveable items and equipment will be removed from work areas by Abatement Contractor prior to start of work and returned upon successful completion of clearance inspection as described in these procedures.

Refer to section 4.02 of this specification for further protection/work area isolation measures.

1.12 UTILITIES

A. General:

All temporary facilities required to be installed, shall be subject to the approval of the Commissioner. Prior to starting of the work at any site, specify clearly the temporary locations of facilities preferably with sketches and submit the same to the Construction Project Manager for approval.

B. Water:

The Department of Design and Construction will furnish all water needed for construction, at no cost to the Abatement Contractor in buildings under their jurisdiction. All temporary plumbing or adaptations to supply the needs of the Work Area shall be installed and removed by the Abatement Contractor and the cost thereof included in the Lump Sum Price Bid for lead work. Shower water for the decontamination unit or hand washing station if needed shall be provided hot. Heating of water, if necessary, shall be provided by the Abatement Contractor.

C. Electricity:

The Department of Design and Construction will furnish all electricity needed for construction, at no cost to the Abatement Contractor. All temporary electrical work or adaptations to supply the needs of the Work Area shall be installed and removed by the Abatement Contractor and the cost thereof included in the Lump Sum price Bid for abatement work.

1.13 DEFINITIONS

The following definitions apply to the work of these procedures:

1. Abatement Contractor- Abatement Contractor is responsible for removing and/or stabilizing the lead-based paint in order to reduce risk to the human health and the environment. Such Abatement Contractor shall be certified by the USEPA to conduct lead-based paint activities in accordance with 40 CFR 745.

2. Action Level – means employee exposure, without regard to respirators, to an airborne concentration of lead of 30 $\mu g/m^3$ of air calculated as an 8-hour time weighted average. Periodic exposure monitoring, biological monitoring, and initial and annual employee training are triggered whenever exposure measurements reach or exceed the action level.

3. AIHA – American Industrial Hygiene Association is a non-profit, international organization of occupational and environmental health and safety professionals practicing industrial hygiene in industry, government, labor, and academic institutions.

4. Air Sampling - The process of measuring the lead content of a known volume of air collected during a specific period of time. The procedure used for lead follows the NIOSH Standard analytical method 7082.

5. Air Sampling Technician: An individual who holds a valid Air Sampling Technician Certificate issued by the New York State Department of Labor.

6. Authorized Visitor - The Construction Project Manager, a visitor authorized by the Construction Project Manager, a representative of any regulatory or other agency having jurisdiction over the project.

7. Barrier - Any surface that seals off the work area to inhibit the movement of lead debris, particles, or lead dust.

8. OEHS: Office of Environmental/Hazmat, Geotechnical and Land Surveying.

9. OEHS Project Manager: Office of Environmental/Hazmat, Geotechnical and Land Surveying Project Manager. OEHS Project Managers hold a valid certification from the USEPA as Lead Risk Assessor.

10. Breathing Zone - A hemisphere forward of the shoulders with a radius of approximately 6 to 9 inches.

11. Clearance Inspection: An inspection of the building components where LBP has been removed and stabilized. For metal surfaces SSPC-VIS 3 guidelines shall be use.

12. Certified Industrial Hygienist (CIH) - An industrial hygienist who is a certified by the American Board of Industrial Hygiene in the Comprehensive Practice of Industrial Hygiene.

13. Competent Person: shall mean one who is capable of identifying existing and predicable lead hazards in the surroundings or working conditions and who has authorization to take prompt corrective measures to eliminate them.

14. Construction Project Manager: shall mean the DDC Program Unit Construction Project Manager.

15. Decontamination Chamber – an enclosed area adjacent and connected to the lead abatement control area and consisting of an equipment room, shower area and clean room which is used for decontamination of workers, materials, and equipment.

16. Demolition - The dismantling and removal of any building component, system, finish, or assembly of a facility together with any related handling operations.

17. ELAP – Environmental Laboratory Accreditation Program is a program of laboratory accreditation which ensures quality of analytical data used for regulatory purposes to meet requirements of regulated materials. ELAP-accredited laboratories demonstrate capability to analyze environmental samples utilizing approved methods.

18. ELLAP: The Environmental Lead Laboratory Accreditation Program, recognized by the EPA National Lead Laboratory Accreditation Program (NLLAP), accredits laboratories performing analysis of lead in environmental samples including paint, soil, dust wipes, composited wipes, and air.

19. ELPAT – Environmental Lead Proficiency Analytical Testing Program is part of the AIHA Proficiency Analytical Testing (PAT) Program, which is a national lead laboratory accreditation program currently recognized by the US EPA. This program is designed to evaluate laboratories' analytical performance.

20. Exposure Monitoring - Sampling of lead concentrations within the breathing zone of an employee.

21. HEPA Filter - A High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97% of particles greater than 0.3 microns in diameter.

22. HEPA Vacuum - Vacuum collection equipment installed with a HEPA filter system.

23. Lead-Based Paint (LBP) - Paint or paint film that contains lead equal to or greater than 0.5% by weight or greater than 1.0 mg/sq.cm.

24. Lead Based Paint Procedures – Preventive measures designed to control and to eliminate exposure to LBP dust and debris during construction renovation activities.

25. Lead Risk Assessor: An individual who hold a valid Lead Risk Assessor certificate issued by the USEPA.

26. Negative Pressure Respirator - A respirator in which the air pressure inside the respiratory-inlet covering is positive during exhalation in relation to the air pressure of the outside atmosphere and negative during inhalation in relation to the air pressure of the outside atmosphere.

27. NIOSH – National Institute for Occupational Safety and Health is a US federal agency responsible for conducting research and making recommendations for the prevention of work-related injuries and illness. NIOSH is part of the Centers for

Disease Control and Prevention (CDC) within the US Department of Health and Human Services. NIOSH is responsible for creating standards of practice which are recommended to be followed by industries for which these standards are issued.

28. NLLAP - National Lead Laboratory Accreditation Program is a program established by US EPA to recognize laboratories that demonstrate the ability to accurately analyze paint chip, dust, or soil samples for lead.

29. Permissible Exposure Limit - The OSHA Lead in Construction standard 29 CFR 1926.62 sets a permissible exposure limit (PEL) of 50 micrograms of lead per cubic meter of air (50 µg/m3) averaged over an 8-hour workday which is referred to as a time weighted average (TWA).

30. Protection Factor - The ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator at the breathing zone of the wearer. The protection factor is a measure of the degree of protection provided by a respirator to the wearer.

31. Removal: Removal of all exterior lead-based paint from the substrate which is deemed feasibly possible due to the age and condition of the substrate.

32. Respirator - A device designed to protect the wearer from the inhalation of harmful atmospheres.

33. Time Weighted Average (TWA) - The average concentration of a contaminant in air during a specific time period.

34. SSPC: The Society for Protective Coatings.

35. SSPC-VIS 3: Guide and Reference Photographs for Steel Surfaces Prepared by Power and Hand Tools Cleaning.

36. Stabilization: Removal of all loose peeling, chipping and rust damaged LBP and the encapsulation of residual LBP which may remain on the substrate.

37. Substrate: The specific building component in which LBP is being removed or stabilized from.

38. Visible Emissions - Any emissions containing particulate material that are visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.

39. Visual Inspection: Inspection performed to assess if a lead-based paint hazard exists or has been abated. Such inspection is to be performed by a USEPA certified Lead Based Paint Risk Assessor. For metal surfaces SSPC-VIS 3 Guide and Reference Photographs for Steel Surfaces Prepared by Power and Hand Tool Cleaning shall be used.

40. Wet Cleaning - The process of eliminating lead contamination from building surfaces and objects by using cloths, mops, or other cleaning utensils that have been dampened with water containing detergent and afterwards bagged and tested to determine proper disposal requirements.

41. Work Area - The restricted area where lead abatement work or lead dust and debris control measures are performed which is defined and/or isolated to prevent the spread of lead, dust or debris, and entry by unauthorized personnel.

PART 2 – WORKMANSHIP, MATERIALS EQUIPMENT

2.01 QUALITY ASSURANCE

1. All work required for the completion of this project or called for in this Specification must be executed in a workmanlike manner by using the appropriate methods established by regulatory requirements and/or industry standards. All workmanship or work methods are subject to review and acceptance by the Construction Project Manager and OEHS Project Manager. Throughout the Specification, reference is made to codes and standards which establish qualities, levels or types of workmanship which will be considered acceptable. It is the Abatement responsibility to comply with these codes and standards during the execution of this work.

2. All materials and equipment required or consumed during the work of this Contract must meet the minimum acceptable criteria established by codes and standards referenced elsewhere in this Specification. Materials and equipment must be submitted for prior approval as part of the Abatement Contractor's "Shop Drawings".

3. It is the Abatement Contractor's responsibility, when so required by the Specification or upon written request from the Commissioner or his representative to furnish all required proof that workmanship, materials and/or equipment meet or exceed the codes and standards referenced. Such proof shall be in the form requested, typically a certified report or test conducted by a testing entity approved for that purpose by DDC.

4. The Abatement Contractor shall be approved by DDC, Construction Project Manager, OEHS, and any other authorized parties to perform the Work.

5. The Abatement Contractor shall have a competent person on site as stipulated in the Code of Federal Regulations 29 CFR 1926.32(f) and 29 CFR 1926.62(b) who shall be responsible to perform the duties required by 29 CFR 1926 et. Seq.

6. The Abatement Contractor shall comply with the Medical Surveillance Requirements in accordance with 29CFR 1926.62(j).

7. The Abatement Contractor shall ensure that workers have successfully completed 10-hour Construction Safety & Health Training, Hazard Communication, lead safe work practices, scaffold training and any other training applicable to the work in accordance with OSHA.

8. The Contractor shall establish and implement a Hazard Communication Program.

9. Pre-Construction Conference:

   Prior to the start of work the Abatement Contractor shall meet with the DDC Construction Project Manager, Facility Manager, OEHS Project Manager and any other parties to discuss the method of Removal and/or Stabilization, work procedures and the acceptable clearance criteria for final visual inspection in accordance with established by federal, state, and local lead-based paint regulations and laws.

2.02 WORK AREA CONDITIONS

A. Throughout the Work, representatives of state or local agencies may visit the site and the work area. The Abatement Contractor shall cooperate with and give assistance to such representatives as may be directed by the Construction Project Manager.

B. Display or have available at all times at the work area a copy of the approved HASP, regulatory notifications, licenses, and certificates required to perform lead-based paint abatement activities.

C. Establish a personnel decontamination zone at the entrance to the work area. At a minimum, the decontamination zone shall contain the following:

1. A change area equipped with separate storage facilities for protective work clothing, equipment, street clothes, and an area for the cleaning and disposal of protective clothing and contaminated articles.

2. Workers shall not leave the decontamination zone wearing protective clothing or equipment worn during the work shift.

3. Hand and face wash facilities for use by workers exposed to paint debris.

D. Furnish and install readily visible caution signs in accordance with 29 CFR 1926.62(m) outside the work area entrance which read:

WARNING
LEAD WORK AREA
MAY DAMAGE FERTILITY OR THE UNBORN CHILD
CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM
DO NOT EAT, DRINKING OR SMOKING IN THIS AREA

E. Furnish and use pumps, tubes, filters, cassettes, and all other equipment necessary to perform employee exposure assessment as specified in 29 CFR 1926.62(d). Perform personal exposure air monitoring for each activity where a potential for lead exposure exists. Exposure monitoring may cease when results for all tasks performed during the LBPWP demonstrate lead exposures below the Action Level.

F. Furnish and use approved respirators, filters, cleaning pads, and all other equipment necessary for a respiratory protection program in accordance with 29 CFR 1910.134(c), (d), (e), and (f) and 29 CFR 1926.62(f).

2.03 SUBMITTALS

A. Pre-Construction Submittals

1. The Abatement Contractor shall attend a pre-construction meeting scheduled by the City of New York Department of Design and Construction. This meeting shall also be attended by the Construction Project Manager, Facility Manager, OEHS Project Manager and a designated representative of the City of New York's Third-Party Air Monitoring firm. The following documents must be submitted at least five (5) days prior to the pre-construction meeting.

a. Abatement Contractors scope of work, work plan and schedule,

b. A Site-Specific Health and Safety Plan (SSHASP) which includes an OSHA job hazard assessment (JHA),

c. Identification of key personnel responsible for site safety, including the name of the competent person employed for the work and the Lead Abatement Supervisor.

d. A written Work Plan which describes in detail the method of removal and/or stabilization of LBP. Procedures for decontamination of personnel, materials, and equipment.

e. Lead Exposure Compliance Program

(1) The Abatement Contractor's Lead Exposure Compliance Program for this contract shall be submitted. Minimum requirements, (such as for equipment, engineering controls, work practices, etc.), shall conform to 29 CFR 1926.62(e)(2), and, where applicable, State, and local regulations. The Abatement Contractor shall base its compliance program on its exposure assessment, using its historic data, objective data, and/or initial and subsequent monitoring.

(2) Initial and subsequent monitoring shall conform to 29 CFR 1926.62 (d).

f. Personal Protective Equipment Program

Submit the Personal Protective Equipment Program, Minimum qualifications are as specified in 29 CFR 1926.32 and, where applicable, State regulations.

g. Submit the Abatement Contractor's Medical Surveillance Program for persons under the supervisory control of the Abatement Contractor who may be occupationally exposed to airborne lead dust above the OSHA action level or other hazardous substances under this contract. Minimal qualifications shall be as specified in 29 CFR 1926.62, or, where applicable, State regulations.

h. Submit SDS and product information on the chemical strippers (if applicable) to be used, including evidence that each possesses the characteristics given in this specification.

i. Submit SDS and product information on the encapsulant (primer) to be used on the residual LBP. Such primer shall be approved by the Construction Project Manager to ensure compatibility with paint to be employed by others.

j. Submit the Safety Data Sheets (SDSs) for any materials brought to the facility, for which SDSs are provided.

k. Submit the Hazardous Waste Management Plan that complies with applicable requirements of federal, state, and local hazardous waste regulations as follows:

(1) Identification of hazardous wastes that may be generated by the Work.

(2) Estimated quantities of wastes to be generated and disposed of.

(3) Names and qualifications of each person or entity that will be transporting, storing, treating, disposing of the wastes. Include the facility location and a 24-hour point of contact. Furnish two copies of EPA, state, and local hazardous waste permits and EPA Identification numbers.

(4) Names and qualifications (experience and training) of personnel who will handle waste generated by the Work.

(5) List of waste handling equipment to be used to perform the Work, including cleaning, volume reduction, and transport equipment.

(6) Spill prevention, containment, and clean-up contingency measures to be implemented.

(7) Work plan and schedule for daily waste containment, removal, and disposal.

(8) Valid waste transporter permit that complies with 6 NYCRR Part 364 for the entity providing waste transportation.

(9) For waste to be disposed of out of New York State, submit permits from states through which the waste will be transported and from states where it will be disposed.

(10) Written evidence that the TSD facility is approved for lead disposal by the EPA and state or local regulatory agencies.

(11) Written description of emergency procedures to be followed in case of injury or fire. This section must include evacuation procedures, source of medical assistance (name and telephone number) and procedures to be used for access by medical personnel (examples: first aid squad and physician). NOTE: Necessary Emergency Procedures Shall Take Priority Over All Other Requirements of These Specifications.

B. During Project Submittals: Submit copies of the following items to the Construction Project Manager during the work:

1. Security and safety logs showing names of person entering work area, date and time of entry and exit, record of any accident, emergency evacuation, and any other safety and/or health incident.

2. Progress logs showing the number of workers, supervisors, hours of work and tasks completed shall be submitted daily to the Construction Project Manager.

3. USEPA LBP Worker and Supervisor certificates. Such certificates shall be posted at the worksite daily.

4. Floor/elevation building plans indicating Contractor's current work progress shall be submitted for review by the Construction Project Manager at weekly progress meetings.

5. Abatement Contractors OSHA personnel exposure air monitoring results shall be submitted on a daily basis until the results can be utilized as OSHA representative data. Such results shall be posted at the worksite.

C. Project Closeout Submittals:

Upon completion of the project and as a condition of acceptance, the Contractor shall present two copies of the following items, bound, and indexed:

1. Project Record: The contractor shall maintain a project record which shall be kept on site at all times. Upon completion of the project, the project record shall be maintained by the building owner. The project record shall be submitted to DDC as part of the close out documents. The project record shall consist of:

   a. Copies of licenses of all contractors involved in the project;

   b. Copies of USEPA and OSHA certificates for all workers engaged in the project;

   c. Copies of all project notifications and reports filed with USEPA and NYSDEC;

   d. A copy of the air sampling log and all air sampling results;

   e. A copy of the abatement contractor's daily log book;

   f. All data related to waste sampling including the results;

   g. Copies of all waste manifests;

2. Lien Waivers from Contractor, Sub-Contractors and Suppliers,

3. A Letter of Compliance stating that all the work on this project was performed in accordance with the Specifications and all applicable Federal, State and Local regulations,

4. All Warranties as stated in the Specifications,

   a. Fully executed disposal certificates and transportation manifests.
      (1) Project Certifications

         i. Documentation that all required permits, certificates, and other arrangements for transportation, treatment, storage, and disposal are in accordance with applicable regulations in one or more approved sites have been obtained. Proof that hazardous waste treatment, storage, transportation, and disposal complies with the Resource Conservation and Recovery Act (RCRA) requirements under 40 CFR 260-299.

         ii. A statement that all commercial licenses required, if any, have been procured by the Abatement Contractor, who will comply with their provisions, holding the City harmless for deficiencies and/or failures thereto.

PART 3 – PRODUCTS

3.01 PRODUCTS – GENERAL

A. All materials shall be delivered in the original packages, containers, or bundles, bearing the name of the manufacturer, the brand name and any Safety Data Sheets that pertain to the materials.

B. All materials subject to damage shall be stored off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damage or contamination.

C. Damaged or deteriorating materials shall not be used and shall be removed from the premises. Materials that become contaminated with lead shall be disposed of in accordance with applicable regulations.

D. No materials, equipment or tools belonging to the City shall be used by the Abatement Contractor, except in case of an emergency upon explicit authorization by the Construction Project Manager.

3.02 MATERIALS

A. Chemical removers and neutralizers

1. Chemical removers used shall not contain methylene chloride. Chemical removers shall be compatible with, and not harmful to, the substrate that they are applied. Chemical removers used on masonry surfaces shall contain anti-stain formulation that inhibits discoloration of stone, granite, brick, and other masonry construction. Chemical removers used on interior surfaces shall not raise or discolor the surface being abated.

B. Chemical Stripping agent neutralizers shall be compatible with, and not harmful to, the substrate to which they are applied. Neutralizers shall be compatible with the stripping agent that has been applied to the surface substrate.

C. Plastic

1. Plastic bags shall be 6 mil (0.15 mm) minimum polyethylene, or sufficiently thicker for large bags so as to prevent release of lead dust through tearing, separation, or other reasonably foreseeable means. Bags shall be labeled with OSHA lead warning and DOT classification or capable of being so labeled as per (29 CFR 1926.62(I)(1)(i) and 40 CFR 262.31).

2. Plastic sheeting shall be 6 mil (0.15 mm) minimum polyethylene and sized in lengths and widths to minimize the frequency of joints. The minimum thickness shall be that which prevents release of lead through tearing, separation or other reasonable foreseeable means. Minimum thickness for sheeting is specified for specific operations in this contract.

D. Packaging

1. Lead disposal packaging shall be suitable to receive and retain any lead-contaminated materials until disposal or conversion at an approved site. The packaging shall be both air and watertight.

2. Packaging of lead-contaminated material shall be packaged, labeled, and marked, and placarded (if required) in accordance with regulations of EPA (e.g., 40 CFR

262.30-33), and DOT (e.g., 49 CFR 172), and State or local occupational safety and health, or environmental agencies, where applicable, and this contract.

3.03 TOOLS AND EQUIPMENT

A. Machine Sanding Equipment

1. Machine sanding equipment shall be of the dual action, rotary action, orbital or straight-line system type, fitted with a high efficiency particulate air (HEPA) dust pick-up system. Air compressors used to operate this equipment shall be designed to continuously provide 90 to 110 pounds per square inch or as recommended by the manufacturer.

B. HEPA Vacuum Equipment

1. Vacuum equipment used for cleaning shall be HEPA-filtered. At least one wet/dry HEPA vacuum shall be available and equipped with floor (hard surface and carpet) cleaning attachments.

2. Scaffolding and Staging

1. Scaffolding and staging shall meet OSHA safety regulations, including 29 CFR 1926.450-452.

C. Transportation Equipment

1. Transportation equipment shall be suitable for loading, temporary storage, transport, and unloading of LBP contaminated materials without exposure to persons or property. The transporter shall be currently registered with the State for transport of hazardous wastes and be currently certified by the State for vehicle inspection.

D. Other Equipment and Tools

1. The Abatement Contractor shall furnish all equipment such as lumber, nails, ladders, HEPA vacuums, and hardware and supplies that may be required to perform the work. The Abatement Contractor shall provide other suitable tools for the abatement activities including but not limited to: hand scrapers, wire brushes, sponges, mops, and shovels.

E. Electrical Tools and Equipment

1. Electrical tools and equipment shall meet all applicable codes and regulations, including, in particular, 29 CFR 1910.333(c)(6). Ground fault circuit-interrupters shall be used at all times for all electrical equipment, as permitted by the National Electrical Code (Paragraph 215-9 “Ground-Fault Protection for Personnel”); unless an assured equipment grounding conductor program is established.

PART 4 – EXECUTION

4.01 WORK AREA PREPARATION

A. Warning Signs

1. The Abatement Contractor shall post adequate warning signs denoting the potential danger of lead at designated entrances to work areas including, as a minimum, those

described in 29 CFR 1926.62(m), and New York State DOL safety and health Subpart 23-1.33 and fire safety regulations, where applicable. The Abatement Contractor shall prevent access to posted areas by unauthorized or inadequately protected persons.

B. Emergency Procedures

1. The Abatement Contractor shall be prepared to administer first aid to injured personnel after decontamination. Seriously injured personnel shall be treated immediately or evacuated without delay for decontamination. A map with Route to the Nearest Hospital is to be provided and posted at the worksite for the duration of the project.

2. Adequate emergency lighting shall be available to permit safe egress of personnel from the work area.

3. The Abatement Contractor shall prepare a plan, train employees in emergency procedures to contain and clean-up dust and debris outside the work area and implement the plan if an emergency occurs.

4. The Abatement Contractor shall maintain adequate portable fire extinguisher equipment within the work area meeting at least the requirements of 29 CFR 1910.157 and, where applicable, state, and local occupational safety and health regulations and fire safety regulations.

C. Protection of Adjacent Surfaces

1. The Abatement Contractor shall take methods to protect adjacent surfaces from damage during LBP work procedures. In the event of damage to existing building equipment, the Construction Project Manager shall be notified immediately. Damages to non-protected adjacent surfaces shall be repaired at the Abatement Contractor's expense.

D. Movable and Fixed Objects

1. The Abatement Contractor shall HEPA vacuum all surfaces in the lead work area(s). Movable objects shall be cleaned using wet and/or HEPA vacuum methods as appropriate before removing movable objects from the work area.

4.02 The Abatement Contractor shall protect all existing fixed objects, existing building finishes that are to remain, and existing systems and functions from damage during the LBP procedures. Extra precautions shall be taken in protecting existing exterior HVAC equipment, exhausts, air intake panels, vents, and fixtures, etc. Framing or other procedures shall be used as necessary to cover these items when direct application of polyethylene sheeting is not appropriate or effective. Heat-generating equipment, such as operating electrical transformers, shall be vented, or otherwise protected, against overheating. **WORK AREA ISOLATION**

A. Sheeting

1. The work area shall be isolated from other parts of the building to ensure that airborne concentrations of lead will not reach or exceed the OSHA action level outside of the lead control area. Doors and windows shall be covered with 6 mil (0.15 mm) plastic sheeting. Windows shall be enclosed from the outside with plastic sheeting and staples if windows are to be scraped, stripped, or removed and replaced.

B. Decontamination Chamber

1. The structure of the decontamination chamber shall be of modular systems or built using wood or metal frame studs or joists. The chamber shall be lined with two layers of 6-mil plastic sheeting sealed airtight. The interior floor shall be covered with two layers of reinforced fire-retardant plastic sheeting with an overlap on the walls.

2. Two overlapping sheets of 6-mil plastic sheeting shall be placed over a framed doorway and secured along the top of the doorway. Secure vertical edge of each sheet along different sides of the doorway, creating a curtained doorway.

3. Lighting, electricity, and heat (if necessary) shall be provided in the decontamination chamber by the contractor.

4. The decontamination chamber shall be placed adjacent to the work area and shall consist of three totally enclosed chambers, separated from the work area and each other with curtained doorways. The chamber shall consist of:

   a. Equipment Room: The equipment room shall have a curtain doorway to separate it from the work area and share a common curtain doorway with the shower room. The equipment room shall be large enough to accommodate at least one worker (allowing them enough room to remove their protective clothing and footwear), and a 6-mil disposal bag for collection of discarded clothing and equipment.

   b. Shower Room: The shower room shall have two curtain doorways: one which separates it from the equipment room and one which separates it from the clean room. The shower room shall contain at least one shower, with hot and cold water, per six workers. Careful attention shall be given to the shower to ensure against leaking of any kind. The Contractor shall supply shampoo and soap in the shower room at all times.

      All water used in the shower shall be collected and passed through a water filtration system capable of filtering particles down to 5 microns prior to being discharged into the sanitary sewer.

   c. Clean Room: The clean room shall share a common curtain doorway with the shower room and shall have a curtained doorway to separate it from outside non-contaminated areas. Lockable lockers for storage of workers' street clothing and shelves for storing respirators shall be provided in this area. Clean disposable clothing, replacement filters for respirators, clean dry towels, and other necessary items shall also be provided in the clean room.

5. All workers and authorized visitor shall enter the work area through the decontamination chamber.

6. From the time the Abatement Contractor is ready to begin LBP work procedures until all Removal and/or Stabilization work is complete, all personnel, equipment, materials, and waste containers leaving the work area shall be decontaminated as per this contract.

C. Covering Floors

1. If work activities (staging, storage, decon etc.) impact interior floors then the Abatement Contractor shall cover floors that are to remain in place with enough 6 mil (0.15 mm) plastic sheeting to prevent damage. Additional layers of 4 mil (0.10 mm) minimum plastic sheet may be used as drop cloths to aid in clean-up of bulk materials.

D. Access to Work Area

1. The Abatement Contractor shall limit access to the work area to its personnel, emergency personnel, applicable regulatory agency personnel, the Third-Party Monitor, the Construction Project Manager and Authorized Visitors.

2. The Abatement Contractor shall provide at least 2 sets of personal protective equipment specified under this contract per 8-hour work shift for Authorized Visitors.

3. All Authorized Visitors shall be subject to the worker protection provisions of this contract.

4.03 EMPLOYEE LEAD EXPOSURE ASSESSMENT AND AIR MONITORING REQUIREMENTS BY ABATEMENT CONTRACTOR

A. Employee Lead Exposure Assessment

1. The Abatement Contractor shall perform an employee lead exposure assessment to determine if any employee is exposed to lead at or above the action level, in accordance with 29 CFR 1926.62(d).

2. Except as specifically exempted, the Abatement Contractor shall collect personal samples representative of a full shift including at least one sample for each job classification in each work area either for each shift or for the shift with the highest exposure level. Full shift personal samples shall be representative of the monitored employee's regular, daily exposure to lead. Worker samples shall be taken in the breathing zones of workers performing LBP procedures in sufficient numbers to permit estimation of peak and Time Weighted Average (TWA) exposures. At a minimum, at least one personal sample on a worker with the highest probable exposure is required in each work area, per 8-hour shift. Air sampling results shall be provided to the OEHS Project Manager within 1 working day after sampling and posted at the worksite.

3. Frequency of worker lead in air exposure shall be determined by the following levels:

   a. At or above the action level - 30 µg Pb per m^3 of air - 8-hour average
   b. Permissible Exposure Limit (PEL)- 50 µg Pb per m^3 – 8-hour average
   c. Allowable Blood Lead Level up to 50 micrograms of lead per deciliter whole blood
   d. Medical Removal Criteria

   Construction Final Rule: Initial test and follow up 50 micrograms of lead per deciliter of whole blood

B. Historic Data and/or Objective Data

1. Historic data and/or objective data may be used in determining the frequency of worker air monitoring when they conform to 29 CFR 1926.62(d) and OSHA's

Instruction CPL 2-2.58 (as noted in the specification of the plan of action). Historical data must be reviewed and approved by the OEHS Project Manager.

C. Notification of Construction Project Manager

1. The Abatement Contractor shall notify the OEHS Project Manager immediately of exposure to lead at or above the OSHA action level outside of the lead control area or above the OSHA PEL within the lead control area. If either of these situations occur, all deleading work in that work area shall stop and the Abatement Contractor shall undertake corrective action as approved by the OEHS Project Manager. The Abatement Contractor may resume LBP work in that area only after it receives written authorization from the OEHS Project Manager. The Abatement Contractor shall not be allowed any extension of time or compensation for damages by reason of, or in connection with, such work stoppages.

D. OSHA Air Monitoring

1. The Abatement Contractor shall furnish and maintain all monitoring equipment and shall show calibration records as required by the OEHS Project Manager. The Abatement Contractor shall bear all costs of OSHA personal air monitoring, analysis, and reporting required herein.

2. Sample Documentation and results for each analysis shall be as submitted the OEHS Project Manager and shall include at least the date and time, sample number, name and signature of each analyst, analytical method, analytical results, limit of detection as per the analytical method, and printed name and signature of a responsible laboratory official.

4.04 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

A. Protective Clothing

1. LBP workers shall wear two (2) disposable suits, including gloves, hood and footwear, and appropriate respiratory equipment. All street clothes shall be removed and stored in a clean room within the work site. The double layer personal protective equipment shall be used for installation of the tent or enclosure and throughout the procedure, if a decontamination unit (with shower and clean room) is contiguous to the Work Area, only one (1) layer of disposable personal protective equipment shall be required; in this case, prior to exiting the tent the worker shall HEPA vacuum and wet clean the disposable suit.

2. Coveralls: provide disposable full-body coveralls and disposable head covers. Require that they be worn by all workers in the Work Area. Provide a sufficient number for all required changes for all workers in the Work Area.

3. Boots: provide work boots with non-skid soles, and where required by OSHA, foot protection, for all workers. Provide boots at no cost to workers. Paint uppers of all boots yellow with waterproof enamel. Do not allow boots to be removed from the Work Area for any reason after being contaminated with lead contaminated debris and/or dust.

4. Hard Hats: provide hard hats as required by OSHA for all workers, and provide a minimum of four spares for Inspectors, visitors, etc. Require hard hats to be worn at all times that work is in progress that may cause potential head injury. Provide hard hats of the type with polyethylene strap suspension. Require hats to remain in the

Work Area throughout the work. Thoroughly clean and decontaminate and bag hard hats prior to removing them from the Work Area at the end of the work shift.

5. Goggles: provide eye protection (goggles) as required by OSHA for all workers involved in any activity that may potentially cause eye injury. Require them to be worn at all times during these activities. Thoroughly clean and decontaminate goggles before removing them from the Work Area.

6. Gloves: provide work gloves to all workers, of the type dictated by the Work and OSHA Standards. Do not remove gloves from the Work Area. Dispose of as lead contaminated waste at the end of the work. Gloves shall be worn at all times, except during Work Area Preparation activities that do not disturb LBP.

7. Reusable footwear, hard hats and eye protection devices shall be left in the contaminated Equipment Room until the end of the lead abatement work.

8. Disposable protective clothing shall be discarded and disposed of as lead contaminated waste every time the wearer exits from the work area to the outside through the decontamination facility.

4.05 WORKER PROTECTION PROCEDURES

A. Interim Controls

1. The Abatement Contractor shall provide workers with the following interim controls until the employee exposure assessment is completed: change areas and hand washing facilities; biological monitoring, to consist of blood sampling and analysis for lead and zinc protoporphyrin; and training on lead hazards, in addition to OSHA Hazard Communication Training. The level of controls shall be increased or decreased as determined by the initial or any additional employee exposure assessment.

2. In addition to these requirements for the prevention of exposure to lead, all normal safety requirements, including, but not limited to, eye protection, electrical safety and fall protection, shall be enforced.

3. Workers shall not eat, drink, smoke, chew tobacco or gum, or apply cosmetics while in the work area.

4. All worker protection procedures, including assurance of respirator fit, and decontamination procedures shall apply to all Abatement Contractor employees and all Authorized Visitors, except in the event of emergency requiring entrance of emergency or security personnel, in which case respiratory protection alone need be provided.

4.06 ENTRY AND EXITING PROCEDURES

A. Beginning of Shift

1. Workers shall change out of their work clothes in the clean area and don personal protective clothing and equipment at the beginning of their shift.

2. Exiting procedures during the shift

a. When exiting the work area during the shift, workers shall vacuum themselves off with a HEPA vacuum. Workers may keep coveralls on but shall remove other personal protective equipment and shoe coverlets in the contaminated equipment room. Workers shall wash their hands and face.

3. Exiting Procedures at the End of the Shift

a. When exiting the work area at the end of their shift, each worker shall remove lead dust from clothing and equipment before leaving the work area by using a HEPA vacuum. Workers shall proceed to the contaminated equipment room and remove all protective equipment and shoes. Each worker shall proceed to the washing area and remove all protective clothing. Underwear may be worn under disposable or other protective clothing if desired. Workers shall then thoroughly wash and shampoo themselves, or if the lead exposure levels are known to be less than the PEL, workers shall at least wash their face and hands. Following washing, each worker shall proceed directly to the change area and dry off. Each worker shall dress in the change area.

4. Contaminated Work Footwear

a. Contaminated work footwear shall be stored in the contaminated/ equipment room when not in use in the work area. Upon completion of lead work practices, the footwear shall be disposed of as contaminated waste or placed in a sealed and labeled plastic bag and either decontaminated or moved to the next job site if it cannot be decontaminated. If the shoes can be decontaminated, such as non-leather shoes, the shoes shall be thoroughly cleaned inside and out using soap and clean water before removal to the uncontaminated area.

4.07 LEAD BASED PAINT ABATEMENT PROCEDURES

A. General Provisions

1. Dust and debris shall be confined within the work area boundaries and all surfaces shall be free from any visible dust and debris accumulation when the work is completed. Follow the procedures described in this section for each phase of the project.

2. Work shall not commence until the work area preparation has been inspected and approved by the Project Monitor and Construction Project Manager.

a. All stairs, platforms and other walking surfaces shall be kept as free as practical from obstructions and accumulation of water. Elevated platforms shall be protected by OSHA specified top rails, mid-rails, and toe boards. A post set-up and daily inspection shall be conducted by the Construction Project Manager and Facility Manager.

b. Ladders of sufficient quantity and of suitable length or height shall be provided. Only electrically non-conductive materials, such as wood or fiberglass, shall be used. Ladders shall be kept in good repair and inspected regularly. Personnel shall be instructed in the proper use of ladders. No structural alterations shall be made to any ladder.

c. The ladders utilized during this project shall be wet cleaned at the completion of the project.

3. Protection of Existing Work

   a. Protect from damage: glass, fixtures, air conditioners, roofing, flashings, and other surfaces within and adjacent to the Work area.
   b. Protect from damage landscaping, paving, and other improvements near the building.
   c. Protect and seal all windows and openings within the Work area with a minimum of 1 layer of 6-mil polyethylene sheeting.

B. Non-Metal Surfaces – Chemical Stripping, Hand-Tool Scraping

1. Surfaces Containing Lead-Based Paint

   a. The removal methods of chemical stripping and hand tool scraping shall be accomplished within a hanging or rigid scaffold completely covered in a washable construction tarp or 10-mil polyethylene. The covering need not be airtight; however, it must be of adequate size and durability to completely enclose the work area and prevent the dispersal of any paint chips or dust during scraping activities.
   b. At ground level the Abatement Contractor shall ensure that the work area is surrounded on all sides by a washable construction tarp or 10-mil polyethylene. The covering need not be airtight; however, it must be of adequate size and durability to completely enclose the work area and prevent the dispersal of any paint chips or dust during paint removal activities.
   c. In addition to the covering surrounding the workers, all scaffolding used for the completion of paint removal shall have the working platform covered with a washable tarp. The tarp shall extend from the working platform up the sides of the scaffold to overlap the covering which surrounds the standing workers.
   d. The area directly below the scaffolding or work area shall be covered with a minimum of one layer of 6-mil polyethylene sheeting. This sheeting shall extend from the working scaffold or work area a minimum of 10 feet in all directions. The sheeting shall be raised on all sides to create a containment for all water used in the paint removal process. As practical and as directed by the DDC and/or its representative, the extension of the sheeting shall increase depending on the height of the scaffold and the location of the work.
   e. All windows in the work area(s) shall be sealed airtight with one layer of 6-mil polyethylene sheeting.

C. Metal Surfaces Removal

1. Surface Preparation Specification No. 2, Hand Tool Cleaning (SSPC-SP 2)

2. Surface Preparation Specification No. 3, Power Tool Cleaning (SSPC-SP 3)

3. Technology Update No. 6, Chemical Stripping of Organic Coating from Steel Structure (TU 6)

D. Alternative Work Procedure

1. When the above methods will not render adequate removal and/or stabilization of the LBP the Contractor may elect to utilize an alternative method which has been presented and approved by the Construction Project Manager and the OEHS Project Manager.

4.08 CLEAN-UP

A. Daily Cleaning Requirements

1. The work site shall be cleaned at the end of each day's LBP work activities. HEPA vacuuming shall be used to exterior surfaces. All equipment shall be cleaned by HEPA vacuuming and wet cleaned with a lead specific washing solution before removing from the LBP work area.

B. Cleaning Requirements Upon Completion of LBP Work

1. Areas in which LBP operations have been completed, shall be cleaned before repainting or replacement of building components. Cleaning shall start at the high point and work down to the low point, by vacuum cleaning using a HEPA vacuum, followed by a wet cleaning with a lead specific detergent wash. The Abatement Contractor may use a garden or similar type low pressure sprayer to wet all surface with a lead specific cleaning solution. After wetting a surface, a wet and dry HEPA vacuum shall be used to vacuum the water from the surface; a wet and dry HEPA vacuum shall be used to vacuum the water from the surface. The wastewater from clean-up shall be contained and disposed of according to this specification.

2. All abated surfaces in the work area(s) including interior textured plaster ceiling, interior metal radiator and exterior concrete wall and surfaces with intact paint shall be cleaned. Any other exterior component that is impacted by lead paint debris or dust during removal must also be cleaned. All surfaces shall be cleaned, except in areas that did not undergo LBP work practices, were properly sealed, or were never entered during the LBP work procedure.

C. HEPA Vacuum

1. The Abatement Contractor's workers that operate the HEPA vacuum shall obtain training in the use of the HEPA vacuum from the manufacturer prior to use. The Abatement Contractor shall use HEPA vacuum attachments, such as various size brushes, crevice tools, and angular tools for varied application, and service the HEPA vacuum routinely to assure proper operation. Caution shall be used any time the HEPA is opened for filter replacement of debris removal. Operators shall wear a full set of protective clothing and equipment, including respirators, when using the HEPA vacuuming equipment, or changing its bag or filter. The Abatement Contractor shall bag and seal HEPA vacuum bags and filters in two 4-mil (0.10 mm) or one 6-mil (0.15 mm) plastic bags. Bags shall be labeled with OSHA lead warnings and DOT classification codes.

D. Large Debris

1. Large debris from demolition (if encountered) shall be wrapped in plastic sheets at least 6 mil (0.15 mm) thick, sealed with heavy duct tape, and stored in the designated area. This debris shall be removed according to this specification.

E. Small Debris

1. Prior to picking-up or collecting small debris, the surface to be cleaned shall be sprayed with a fine mist of water. The debris will be picked up, collected, and placed into a single plastic bag at least 6 mil (0.15 mm) thick, or double bags of 4 mil (0.10 mm) thick plastic. The bags shall not be overloaded, be securely tied, and stored in the designated area until disposal.

F. Liquid Waste

1. The Abatement Contractor shall contain and properly dispose of all liquid waste, including lead-contaminated water used in cleaning the LBP work areas.

2. The Abatement Contractor shall place solvent and/or stripper residues in drums made out of materials that cannot be dissolved or corroded by chemicals. Solvents, caustics, and acid waste shall be segregated and not stored in the same containers.

G. Visual Inspection

1. The Third-Party Risk Assessor shall clear the project based on visual inspection. Prior to the OEHS Project Manager's visual and physical inspection for clearance, the Abatement Contractor shall certify the following:

   a. For Removal of LBP:
      - Non-Metal Surfaces: Visual confirmation of the removal of all painted surfaces
      - Metal Surfaces: Cleaning shall be based on SSPC-VIS 3 Reference guide: from initial condition G to Degree of Cleaning G SP 2, utilizing Hand Tools; and to Degree of Cleaning G SP 3, utilizing Power Tools
   b. The Work Area has been cleaned in accordance with Section 4.08B of this specification.
   c. The surrounding non-work areas are free from visible paint chips, dust, and debris.
   d. LBP waste and debris inside and outside the work area have been collected and bagged in accordance with Section 4.09 of this specification.

2. If the project does not pass the visual inspection, the Abatement Contractor will re-clean the LBP work area. After re-cleaning, the Third-Party Project Monitor and OEHS Project Manager will again inspect the work area.

H. Final Clearance Inspection

1. After the final cleanup by the Abatement Contractor is complete, the final inspection will take place. As with the preliminary visual inspection, the final inspection has two primary goals. The first is to ensure that the interior and exterior LBP has been sufficiently removed and/or stabilized. The second is to detect the presence of lead dust or debris on any building surfaces, sidewalks, or soil. The primary post abatement hazard is lead-contaminated surface dust. To meet the two goals of the final inspection, the Lead Risk Assessor will perform a thorough visual inspection of each surface area which was abated and all adjacent areas (e.g., exterior wall, walkways, etc.). If the visual inspection results for Stabilization project find loose, peeling or rust damaged surfaces or un-encapsulated LBP surfaces, or insufficiently complete removal of LBP for Removal project, the Abatement Contractor will be notified, and the area will be re-cleaned until satisfactory results are achieved.

2. Any extra costs incurred by the Third-Party Project Monitor and/or Lead Risk Assessor subsequent inspections because of clearance failure shall be borne by the Abatement Contractor.

3. The work area will be determined to be free of lead-based paint hazards by the EPA certified Risk Assessor.

4.09 WASTE DISPOSAL

1. Regulations

   1. The basic Federal Law governing waste disposal is the Resource Conservation Recovery Act (RCRA) of 1976 and 1984. For lead paint waste, lead is the toxic constituent with a limit of five (5) parts per million as determined by the Toxicity Characteristics Leaching Procedure (TCLP). If this limit is exceeded, the waste is deemed to be hazardous waste.

      Waste generated during the LBP process may include the following:

      a. Waste Storage Drums
      b. Lead Paint Dust
      c. Plastic and tape used to cover floors and other surfaces during abatement
      d. Liquid waste, such as wash water from abatement clean-up
      e. Rags, sponges, mops, HEPA filters, air monitoring cartridges, scrapers, and other materials used during abatement, and clean-up
      f. Disposable work clothes and respirator filters

   2. Hazardous waste must be disposed of at a hazardous waste disposal facility, usually called a treatment storage and disposal (TSD) facility. A TSD must have an EPA ID Number and authorization (either a permit or “interim status”) to operate.

   3. The hazardous waste transporter which hauls waste to a TSD must have a transportation permit number and must meet U.S. Department of Transport (DOT) requirements for shipping containers.

   4. Special care must be taken in removing hazardous waste from the work site, in order to avoid environmental contamination or injury to workers or residents. While in the work area, the exterior of the filled waste containers should be HEPA vacuumed and wet-wiped to remove residual contamination. If plastic bags are used, they should be bagged again as they come out of the work area.

   5. Abatement Contractor shall submit to DDC the name and address & EPA ID Number of the transporter that he proposes to use along with the transporters experience and qualifications prior to the start of abatement activities.

   6. Hazardous waste shall be stored in 55-gallon drums, tanks, or other containers suitable for the type of waste generated. Professional judgment must be followed to protect human health and the environment, and to reduce the likelihood of damages or injuries caused by leaks or spills of hazardous waste.

   7. The waste storage area should be secured, and all containers should be marked “HAZARDOUS WASTE,” with contents identified. Containers should be inspected for leaks or corrosion every week.

   8. The waste storage area shall be enclosed by a fence or tape and warning signs shall be displayed around the perimeter if waste is stored on site. If the same storage site is also used for equipment and supplies, the waste containers shall be segregated within the site, by placing all the debris material in assigned area within the secured site and surrounding this area with a temporary tape or rope. The site shall be adequately protected from vandalism or unauthorized access by the public.

2. Uncontained Debris

1. During the actual LBP work activities, the Abatement Contractor shall not leave uncontained debris outside, incinerate debris, dump waste by the road or in an unauthorized dumpster, or other container, or introduce lead-contaminated water, as determined by Toxicity Characteristic Leaching Procedure (TCLP) into storm or sanitary sewers. Wastewater from showers and hand washing facilities do not require testing by TCLP. This water shall be filtered through a water filter with pore size of 5 micrometer or smaller, before discharge to the sanitary sewer (use of one or more larger pore sized prefilters is permitted to minimize final filter clogging and filter changing costs). Additional stringent requirements of Federal, State, regional and local authorities governing the discharge of lead containing water to the sewer system shall be followed.

3. Testing Representative Lead Wastes

1. The Abatement Contractor shall test representative lead-based paint wastes to determine if materials are regulated under RCRA, 40 CFR Part 261. The Abatement Contractor shall use TCLP to determine if a lead contaminated material is classified and regulated under RCRA. If the TCLP determines that the lead concentration is 5 parts per million or greater, the waste is regulated by RCRA. The Construction Project Manager may also take and analyze samples.

2. The following materials shall be tested to determine whether or not they are classified as hazardous waste or shall be presumed to be:

a. Paint chips
b. Wastewater (wash water from showers and hand washing facilities are exempt)
c. Dust from HEPA filters and from damp sweeping
d. Plastic sheets, duct tape, or other items used during the LBP removal
e. Solvents and caustics used during the stripping process
f. Liquid waste, such as wash water used to decontaminate surfaces after solvents have been used, and liquid waste from exterior water blasting
g. Rags, sponges, mops, HEPA filters, respirator cartridges, scrapers, and other materials used for testing, abatement, and clean-up
h. Disposable work clothes and respirator filters
i. Any other items contaminated with lead

4. Disposal of Non-Hazardous Solid Waste

1. The Abatement Contractor shall dispose of <u>non-hazardous solid waste</u> (as determined by testing as follows:

a. Solid waste which has been evaluated and determined not to be hazardous can be disposed of in a State approved landfill. Large debris, if encountered, shall be wrapped in 6-mil (0.15 mm) plastic, sealed with tape, and moved to the trash storage area. Small debris, such as disposable clothing shall be placed in two 4-mil (0.10 mm) or one 6-mil (0.15 mm) plastic bags, sealed, and placed in the trash storage area.
b. Non-hazardous waste shall be transported to a state and/or county approved landfill in covered vehicles. Residential or commercial trash collection services should not be used without approval of state or local authorities.
c. The Abatement Contractor shall ensure that the waste material is adequately covered to ensure that no dust or debris is released. Any waste-hauling or disposal sub-Abatement Contractor shall be informed by the Abatement Contractor of the presence of lead.

d. DDC requires waste (both hazardous and non-hazardous) to be expeditiously removed from the premises and disposed of at an EPA approved dumpsite. All waste disposal manifests shall be submitted to DDC and failure to do so may result in withholding of payment.

e. The maximum duration of the waste remaining on site shall be 10 business days or end of the project, whichever comes first.

5. Disposal of Hazardous Solid Waste

1. The Abatement Contractor shall dispose of hazardous solid waste (as determined by testing or presumptions) as follows:

a. The Abatement Contractor shall comply with RCRA and applicable state and local hazardous waste regulations.
b. A Hazardous Waste Report (Report), for each calendar year, is required and must be submitted by large quantity generators and treatment, storage and/or disposal facilities in New York State. The Report must be submitted to and received by the DEC by March 1 of each year. A separate Report is required for each United States Environmental Protection Agency registered location (site). Generators and facilities are required to submit a Report if, any one of the following criteria applies, as outlined in the NYSDEC 2017 Hazardous Waste Annual Report.
c. The Abatement Contractor will comply with EPA and DOT regulations for containers. The Abatement Contractor shall contact the state and local authorities to determine their criteria for containers. The more stringent regulations shall comply.
d. If the Abatement Contractor is not a certified hazardous waste transporter, it shall become one or enter into a contract with a certified transporter to transport the waste. The Abatement Contractor shall require the certified hazardous waste transporter to follow RCRA regulation.
e. DOT class 9 shipping labels shall be applied to or be printed on each packaging of lead-contaminated materials which is being shipped by air, exceeds 66 pounds (30 kg), or is smaller but does not have inner packaging up to 11 pounds (5 kg) or less in the strong outer packaging.
f. After the sealed double containers have been passed out of the lead work area, they shall immediately be placed in a cart approved by the Construction Project Manager. When a sufficient number of containers have accumulated, the cart shall be taken to a specified transportation vehicle, or a designated holding area and the containers shall be placed therein. Each vehicle transporting lead-contaminated waste shall be marked with LBP danger signs during loading and unloading of the waste.

6. Hazardous Waste Manifests

1. Upon submitting the hazardous waste manifests for a shipment of LBP waste to the Construction Project Manager for signature, the Abatement Contractor shall make available the transport vehicle and the lead-contaminated waste packages for inspection by the Construction Project Manager so that the Construction Project Manager can check for significant discrepancies in the amount of waste (for example, number of bags or drums, or volume of waste) and its condition (for example, whether the bags or drums appear to be sealed and not leaking).

2. Hazardous waste manifests signed by the Construction Project Manager, the Abatement Contractor and the initial transporter shall be provided to NYCDDC and

the Facility Manager when lead-contaminated wastes are removed from the facility property.

3. Completed waste manifest(s) signed by the Abatement Contractor, all transporter(s), transferor(s), disposal and/or treatment facility(ies), shall be provided to the Construction Project Manager and NYCDDC within 30 days of the time at which the lead-contaminated wastes are received at the disposal and/or treatment facility(ies), which shall be no longer than 40 days after the waste was accepted by the initial transporter.

7. Abatement Contractor Hazardous Waste Responsibilities

   1. The Abatement Contractor shall properly transport, treat, store, and dispose of lead-contaminated waste, and other hazardous wastes generated under the contract in accordance with all applicable regulations.

   2. The Abatement Contractor shall notify the National Response Center (800-424-8802) of the release of a reportable quantity of a hazardous substance generated in accordance with the contract (40 CFR 302.4[Table], 302.6(a),(b)).

   3. The Abatement Contractor shall hold the City harmless from any release or threat of release following its acceptance of any hazardous substance generated in accordance with the contract (CERCLA sections 101(20)(B)(I), 107(a)(4), (b), (e)).

4.10 RE-ESTABLISHMENT OF OBJECTS AND SYSTEMS

A. Follow-up Work

   1. When clean-up is complete the Abatement Contractor shall perform follow-up, work described below.

   2. Any items moved from the work area in preparation for LBP work procedures shall be replaced and reinstalled, with materials, finishes, location and workmanship to match existing conditions before the start of work, or as otherwise specified under this contract.

   3. Heating, ventilation, air conditioning, mechanical, and electrical systems shall be reestablished in proper working order, with the coordination of the Construction Project Manager.

   4. Painting of abated LBP surfaces which will performed by others not under this specification shall be performed by Contractors who hold a valid Renovation, Repair and Painting (RRP) Certificate issued by the USEPA.

PART 5 – THIRD PARTY MONITORING AND TESTING LABORATORY SERVICES

5.01 THIRD PARTY MONITORING TESTING LABORATORY

Work area monitoring, visual inspections, dust wipe and soil sample collection (if required) shall be performed in accordance with the most stringent of the Federal, State and City of New York Laws and Regulations and the latest amendments to these laws. They shall be performed by a third-party monitor and testing laboratory employed by the DDC under a separate contract. The cost of this work is not to be included in the Bid.

Personal Exposure Monitoring of the Abatement Contractor's employees shall be performed in accordance with OSHA 29CFR 1926.62. All costs associated with the worker exposure monitoring of the Abatement Contractors employees shall be incurred by the Abatement Contractor and is to be included in the Bid.

The testing laboratory shall be accredited by the New York State Department of Health Environmental Laboratory Accreditation Program (ELAP) and National Institute of Standards and Technology under their current NLLAP laboratory program. The laboratory shall successfully participate in the NIOSH/AIHA ELPAT Program for heavy metals analysis.

5.02 AREA INSPECTIONS AND MONITORING

A. Site Visits and Inspections

1. The Third-Party Project Monitor will conduct site visits and inspections, perform area air sampling inside and outside the work area and immediately adjacent to the work area during work. The Lead Risk Assessor may take wipe samples to determine if the Abatement Contractor is maintaining surfaces of hygiene facilities (e.g., change areas, storage facilities, lunchrooms or eating areas) or occupied work areas outside the lead work area(s) free from lead contamination.

B. Sampling of Other Building Areas

1. The Third-Party Monitor may sample other building areas during work to assess the potential exposures to City staff and visitors.

C. Inspection of Work

1. The Third-Party Monitor may inspect the project including integrity of isolation barriers, decontamination facilities, protective coverings; plumbing; electrical equipment safety and grounding; worker protection program; air monitoring program; performance of lead dust control measures including work area preparation, removal, stabilization, and disposal; emergency equipment and procedures; and conformance to federal, state, and local regulations.

D. Corrective Action and Stop Work Orders

1. If, at any time, the Third-Party Monitor determines that Abatement Contractor practices or procedures are in violation of the provisions of this specification or regulations and may endanger workers, tenants, the general public or the facility, the Third-Party Monitor shall contact OEHS Project Manager immediately and the Abatement Contractor will be notified orally to stop work and employ immediate corrective action. The Abatement Contractor shall not be allowed any extension of time or compensation for damages by reason of, or, in connection with such work stoppages.

E. Exceeding Lead Concentrations

1. If worker or work area lead concentrations are measured above the Permissible Exposure Level (PEL) or concentrations outside of the work area are at or above the OSHA action level, all work in that work area shall stop and the Abatement Contractor shall undertake immediate corrective action as approved by the OEHS Project Manager. The Abatement Contractor may resume abatement work in that area only after it receives authorization from the OEHS Project Manager. The Abatement Contractor shall not be allowed any extension of time or compensation for damages by reason of or in connection with such work stoppages.

F. Certification of Completion of Work

1. Prior to the Third Party Project Monitor and Risk Assessor beginning visual and physical inspection for clearance, the Abatement Contractor shall certify the following: removal and stabilization of all specified LBP; cleaning of specified work area surfaces and surrounding area surfaces, collection and proper storage (bagged/drummed) of LBP waste and debris inside and outside the work area in accordance with this contract and RCRA; and that the work area is ready for visual clearance inspection.

5.03 WORK CLEARANCE

A. Work clearance shall be achieved by visual inspection of the work area and surrounding areas by the Third-Party Monitoring Firm's USEPA certified Lead Risk Assessor.

B. Clearance shall consist of the following procedures for:

1. For Removal of LBP:

1. Non-Metal Surfaces: Visual confirmation of the removal of all painted surfaces.
2. Metal Surfaces: Cleaning shall be based on SSPC-VIS 3 Reference guide: from initial condition G to Degree of Cleaning G SP 2, utilizing Hand Tools; and/ or to Degree of Cleaning G SP 3, utilizing Power Tools.
3. The work area, surrounding areas which were sealed during the abatement must be free of all visible paint chips, dust, debris, and other project generated waste and/or equipment and materials.
4. The walkways, soils and facades must be free of all visible paint chips, dust, and debris.
5. Waste materials, project supplies and project equipment must be properly contained and secured.

C. If the work area and/or surrounding area does not pass the first visual inspection, the Abatement Contractor must re-clean the work area and/or surrounding area using HEPA vacuums, mopping or other measures to properly remove paint chips, dust, debris, etc. The Abatement Contractor shall be responsible for all expenses that result from a second or subsequent clean ups.

END OF SECTION 02 83 19

SECTION 03 15 00 - CONCRETE ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes: all labor, materials, equipment, services and transportation for reinforcing steel, accessories, embedments and miscellaneous anchorage accessories, joint fillers, and waterstops for cast-in-place concrete work as shown on Drawings, as specified herein, and as required by the job conditions.

B. Related Section:
   1. Section 03 30 00 "Cast-in-Place Concrete".

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Shop Drawings: Submit for action shop drawings that clearly indicate, but not limited to:

   1. All details, dimensions and information required for fabrication and placement of concrete reinforcement in accordance with Contract Documents, prepared in accordance with ACI 315 recommendations.
   2. Elevations, plans, sections, and dimensions of concrete work with required reinforcement clearances.
   3. Ledges, brackets, openings, sleeves, anchor rods, embedments, prefabricated bent-in dowel keyway systems, electrical conduit and items of other trades including interference with reinforcing materials.
   4. Sizes, grade designations, spacing, locations, and quantities of synthetic macro fiber additive, reinforcement bars, temperature and shrinkage reinforcement dowels.
   5. Do not use dimensions scaled from Contract Drawings to determine bar lengths. Hooks and bends not specifically dimensioned to be detailed per ACI 318.
   6. Bending and cutting schedules, assembly diagrams, splicing and connection requirements, details, and laps.
   7. Each type of supporting and spacing devices, including miscellaneous accessories.
   8. Construction joint type, details and locations. Contractor to coordinate construction joint type, details, and locations with concrete pour schedule. Submittal will include details for each type of construction joint in accordance with Contract Documents.
      a. Locations and dimensions of openings in structural members including floor slab,

shear walls, columns and beams.

b. Concrete accessories and embedded items.

B. Product Data:

1. Submit for action for each type of product identified. Product Data must be clearly marked to indicate all technical information which specifies full compliance with this section and Contract Documents, including published installation instructions and I.C.C reports, where applicable, for products of each manufacturer specified in this section.

C. Mill Reports:

1. Submit for record.

D. Reinforcement Strain Test:

1. For Grade 75 reinforcement, submit for record certification that steel has a yield strength of no less than 75 ksi as measured by both ASTM A615 and ACI 318 Section 3.5.3.2 procedures.

E. Hazardous Materials Notification:

1. Submit for record. In the event no product or material is available that does not contain hazardous materials as determined by the City of New York, a "Material Safety Data Sheet" (MSDS) equivalent to OSHA Form 20 must be submitted for that proposed product or material prior to installation.

1.5 CODES AND STANDARDS

A. Building Code: Concrete work must conform to the requirements of the New York City Building Code identified on the Structural General Notes, and OSHA requirements, except where more stringent conditions or criteria occur in the standards referenced below and on the Drawings.

B. Standards:

1. ACI 117 – Standard Specifications for Tolerances for Concrete Construction and Materials.
2. ACI 301 –Specifications for Structural Concrete.
3. ACI 302 – Guide for Concrete Floor and Slab Construction
4. ACI 315 – Details and Detailing of Concrete Reinforcement.
5. ACI 318 – Building Code Requirements for Structural Concrete and Commentary.
6. ACI 355.2 – Qualification of Post-Installed Mechanical Anchors in Concrete and Commentary
7. ACI 355.4 – Qualification of Post-Installed Adhesive Anchors in Concrete and Commentary
8. ACI 360 R– Design of Slabs on Grade
9. American Society for Testing and Materials "ASTM Standards in Building Codes", various standards as referenced herein.
10. AWS D1.1 – Structural Welding Code-Steel.
11. AWS D1.4 – Structural Welding Code-Reinforcing Steel.
12. CRD C 572 – Specification for Polyvinylchloride Waterstops.

13. Concrete Reinforcing Steel Institute "Manual of Standard Practice"
14. ASTM D3963 Fabrication and Jobsite Handling of epoxy Coated Steel Reinforcing Bars.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. The work of this section must be performed by a fabricator specializing in the type of reinforcement fabrication required for this Project, with a minimum of 3 years of documented successful experience and must be performed by skilled workmen thoroughly experienced in the necessary crafts.
   1. Welders must be qualified in accordance with applicable AWS Code within 12 months before starting the work.
      a. Make qualification records available to the Commissioner upon request.

C. Manufacturers must specialize in manufacturing the types of concrete accessories required for cast-in-place concrete work, with a minimum of 3 years of documented successful experience and must have the facilities capable of meeting all requirements of Contract Documents as a single-source responsibility and warranty for each type of accessory.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver reinforcing steel to Project site bundled, tagged and marked.
   1. Use weatherproof tags indicating bar sizes, lengths and other information corresponding to markings shown on placement diagrams.

B. Deliver welded wire fabric in sheets. Do not deliver in rolls.
C. During construction period, properly store reinforcing steel and accessories to assure uniformity throughout the Project.
D. Deliver and store welding electrodes in accordance with AWS D1.4.
E. Immediately remove from site materials not complying with Contract Documents or determined to be damaged.
F. Store reinforcing steel above ground so that it remains clean.
   1. Maintain steel surfaces free from materials and coatings that might impair bond.
   2. Keep covered.
   3. Protect against corrosion or deterioration of any kind.

1.8 SPECIAL INSPECTIONS

A. The contractor will be responsible for, and bear all costs associated with the filing and securing of approvals, if any, for Form TR3: Technical Report Concrete Design Mix, including, but not limited to, engaging the services of a New York City licensed Concrete Testing Lab for the review and approval of concrete design mix, testing, signatures and professional seals, etc., compliant with NYC Department of Buildings requirements, for each concrete design mix.

1.9 WARRANTY

A. Product Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of accessories that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 2 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 REINFORCEMENT

A. Reinforcing Steel:

1. Type: Deformed billet steel bars, ASTM A 615, Grade 60 or 75 as indicated on Drawings.
2. Size: As indicated on structural Drawings.
3. Where indicated on Drawings, reinforcing steel must be hot-dipped galvanized after fabrication in accordance with ASTM A 767, Class II, with galvanizing material protected from embrittlement during galvanizing process in accordance with ASTM A 143.
   a. Galvanized finish must meet the bend and shear test requirements of ASTM A 615.
4. Epoxy-Coated: ASTM A 775 for foundation walls.
5. Weldable reinforcement: ASTM A 706 where indicated on Drawings.

B. Welded Wire Reinforcement:

1. Type: steel wire, deformed, ASTM A 496.
2. Size: As indicated on structural Drawings.
3. Where indicated on Drawings, welded wire reinforcement must be hot-dipped galvanized after fabrication in accordance with ASTM A 767, Class II, with galvanizing material protected from embrittlement during galvanizing process in accordance with ASTM A 143.
   a. Galvanized finish must meet the bend and shear test requirements of ASTM A 615.
4. Plain Steel Welded Wire Reinforcement: ASTM A 1064.
5. Deformed Steel Welded Wire Reinforcement: ASTM A 497.
6. Epoxy-Coated Welded Wire Reinforcement: ASTM A 884, Class A.

C. Structural Synthetic Macro Fibers Reinforcement:

1. Synthetic macrofiber: astm c1116 type iii, polyolefin virgin macrofibers, 1.5-2.0 inch long, aspect ratio of 50 to 90, flexible self-fibrillating or rigid embossed fibers. Dosage for synthetic macrofibers must be determined based on the required residual strength (fe3) in accordance with astm c1609 and general recommendations of aci 544.4r-18. See concrete properties table e.
2. For composite metal decks, fibers must be UL-certified for 2-hour test series d700, d800,

and d900 floor-ceiling assemblies where specified.
3. Consult fiber manufacturer for recommendations regarding dosage, mix design, mixing, pumping, finishing, and polished concrete finishes with fibers.
4. For Slabs on grade design to meet requirements of ACI 360R design of Slabs on Grade.
5. Product: Subject to compliance with requirements, provide one of the following:
   a. Strux 75-32 Synthetic Macro Fibers
   b. Euclid Chemical; Tuf Strand Series SF Synthetic Macro Fibers
   c. Sika USA; Synthetic Macro Fibers
   d. Or approved equal.

D. Shear Reinforcement At Slab-Column Connections:

1. Shear studs must be:
   a. in accordance with ASTM A108, Grade C1015.
   b. Rails must be low carbon steel Type 44W.
   c. Studs must be welded in accordance with AWS D1.1.

2. Size: As indicated on structural Drawings.
3. Installation: Per manufacturer's instructions.
4. Supports: Use plastic molded plastic chairs as provided by the manufacturer to maintain the bottom rebar cover as specified on the Drawings. Tie studrails to adjacent top bars to maintain vertical position.
5. Basis of Design Product: Subject to compliance with requirements, provide Steel studrail assemblies for shear reinforcement at slab-column connections by Decon: Studrails supplied by Decon USA, or comparable product by one of the following:
   a. Tru Weld Stud Welding Equipment
   b. JSW Stud Rails
   c. Or approved equal.

E. Reinforcement Coating Repair Materials:

1. Apply repair coating in accordance with the manufacturer's written procedures.
2. Galvanized Repair Coating: Zinc-based solder, paint containing zinc dust or sprayed zinc complying with ASTM A780.
3. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating; compatible with epoxy coating on reinforcement and complying with ASTM A 775/ A 775M.
   a. The maximum amount of repaired damaged areas must not exceed 2% of the surface area in each linear foot of each bar. If more than 2% of the surface area in each linear foot of bar is damaged, bar must be replaced.
   b. VOC content of repair coatings: must not exceed 340 g/L.

2.2 ACCESSORIES

A. Tie Wire:

1. Type: Minimum 16 gauge (1.5mm) annealed steel wire, ASTM A 510 and ASTM A 853.
2. Wire Bar Type: Comply with CRSI.

B. Mechanical Splicing Systems:

1. Mechanical tension and compression splicing systems must be used where indicated on Drawings or at contractor's option. For seismic design categories D, E and F, in plastic hinge regions, only Type 2 mechanical splices are permitted.
2. Acceptable Products: Splices must be installed in compliance with manufacturer's requirements.
3. Mechanical and welded tensile mechanical splicing systems must be capable of developing 125% of the reinforcing steel ASTM specified minimum yield strength (Type 1) except where indicated as Type 2 (100% of specified tensile strength).
4. Mechanical compression splices must be such that the compression stress is transmitted by end bearing held in concentric contact.
5. Product: Subject to compliance with requirements, provide one of the following:
   a. Dextra; Bartec Couplers
   b. Erico; Lenton Cadweld
   c. Dayton Superior; Bar Lock coupler system
   d. Bar Splice: Grip-Twist
   e. Bar Splice: ZAP Screwlok
   f. Erico; Lenton Couplers
   g. Or approved equal.

C. Headed Bars:

1. For bar sizes #11 (ø36) or smaller where specifically detailed on Drawings, mechanical bar terminators must be used.
2. Product: Subject to compliance with requirements, provide one of the following:
   a. Dextra; Bartec End Anchors
   b. Erico; Lenton Terminator
   c. Bar-Splice; Grip-Twist Doughnut
   d. Dayton Superior; Bar Lock End Anchorage System
   e. Or approved equal.

D. Supports for Reinforcement:

1. Types: Bolsters, chairs, spacers, clips, chair bars, and other devices for properly placing, spacing, supporting, and fastening the reinforcement, plastic, plastic protected steel, or epoxy coated to match supported reinforcement.
2. For Contact with Forms: Use types with not less than 3/32" (2.5mm) of plastic between metal and concrete surface.
   a. Plastic tips must extend not less than ½" (12mm) on metal legs.

3. Individual and continuous slab bolsters and chairs must be of type to suit various conditions encountered and must be capable of supporting 300 pound (1.5kN) load without damage or permanent distortion.
4. Unless otherwise indicated on Drawings, bottom reinforcing bars in footings must be supported by precast concrete bricks or individual high chairs with welded sand plates on bottom.
5. For Slabs on Grade: Use supports with sand plates or horizontal runners where base material will not support chair legs.

E. Deformed Bar Anchors:

1. Type: Automatic end welded, ASTM A 496 quality.
2. Size and Grade: As indicated on structural Drawings
3. Basis of Design Product: Subject to compliance with requirements, provide deformed bar anchors by Nelson Stud Welding or comparable products by one of the following:
   a. Stud Welding Products, Inc
   b. TSA Manufacturing
   c. Or approved equal.

F. Anchor rods and dowels:

1. Types and Sizes: Provide sizes and types of anchor rods and dowels as indicated on the Drawings. Each type of anchor must be manufactured of structural quality steel, designed for cast-in-place concrete applications and be of sizes as indicated on Drawings, complete with washers, nuts, plates and miscellaneous accessories required to meet Contract Document requirements.
2. Adhesive Anchors for anchor rods and dowels in existing concrete: See Anchorage Accessories.

G. Prefabricated Bent-In Dowel Keyway System:

1. Type, Size and Grade as indicated on Drawings. Install Per Manufacturer's instructions.
2. Product: Subject to compliance with requirements, provide one of the following:
   a. Erico; Lenton Form Savers
   b. Meadow Burke; Stabox
   c. Dayton Superior; Metalstrip
   d. Or approved equal.

2.3 ANCHORAGE ACCESSORIES

A. General: Miscellaneous anchorage accessories for anchoring structural, architectural, electrical, and mechanical items to poured concrete must include but not be limited to the following:

1. Concrete Anchors: Headed or bent studs ASTM A 108/Grade 1015 through 1020, minimum yield strength of 50,000 psi (345MPa), minimum tensile strength of 60,000 psi (415MPa).
2. Anchor Rods: ASTM F1554, Grade as noted on Drawings.
3. Threaded Inserts:
   a. Manufacturer: Subject to compliance with the requirements, provide products by one of the following:
      1) Dayton/Richmond Screw Anchor Co.,
      2) Powers Fasteners, Inc.
      3) Cox-Industries
      4) Or approved equal.

4. Adhesive Anchors:

a. Basis of Design Product: subject to compliance with requirements, provide HIT HY 70 Adhesive Anchors or comparable product by one of the following:
   1) HIT-RE 500-SD by Hilti, Inc.,
   2) Epcon C6+ by ITW Red Head,
   3) Epcon G5 by ITW Red Head,
   4) PE 1000+ by Powers Fasteners,
   5) Pure 110+ by Powers Fasteners,
   6) SET-XP by Simpson Strong-Tie Co.,
   7) Or approved equal.

b. The adhesive anchor system used for post-installed anchorage to concrete must conform to the requirements of ACI 355.4 and commentary and must possess a current ICC- ES report demonstrating compliance with ACI 318.

c. VOC content of post-installed adhesive anchor inside the weatherproofing barrier must not exceed VOC limits of South Coast Air Quality Management District (SCAQMD) Rule 1168, effective 7/1/2005 and amendment dated 1/7/2005 for the application.

5. Field Drilled Expansion Anchors:
   a. Basis of Design Product: subject to compliance with requirements, provide Kwik Bolt 3 Adhesive Anchors or comparable product by one of the following:
      1) Power Stud+ SD1 or SD2 by Powers Fasteners,
      2) Power Stud + SD6 (SS) by Powers Fasteners,
      3) Trubolt or Trubolt + by ITW Red Head,
      4) Strong-Bolt by Simpson Strong-Tie Co.,
      5) Or approved equal.

   b. The expansion anchors used for post-installed anchorage to concrete must conform to the requirements of ACI 355.2 and commentary and must possess a current ICC- ES report demonstrating compliance with ACI 318.

6. Threaded Screw Anchors:
   a. Basis of Design Product: subject to compliance with requirements provide Screw Anchors by Hilti or comparable product by one of the following:
      1) Wedge Bolt+ by Powers Fasteners,
      2) Tapcon by ITW Red Head,
      3) Titan HD by Simpson Strong-Tie Co.,
      4) Or approved equal.

7. Inserts and Coil Rods: Yield strength 65,000 psi (450MPa), ASTM B 633,
   a. Manufacturers: Subject to compliance with the requirements, provide product by one of the following:
      1) Acrow-Richmond Limited,
      2) Dayton Superior,
      3) All Fasteners
      4) Or approved equal.

8. Welding Electrodes: AWS 5.5, Series E70.
9. Welded Deformed Bar Anchors: Welded by full-fusion process.
10. Basis-of-Design Product: Subject to compliance with requirements, provide installation

by TRW Nelson Stud Welding Division, or comparable product by one of the following:
a. KSM Welding Division
b. Omarak Industries
c. Tru-Weld Stud Welding
d. Or approved equal.

B. Dovetail Anchor Slots:

1. Type: Formed 22 gauge (0.85mm) galvanized steel.
2. Location of Use: Continuous installation of anchor slots, full height of masonry walls, where masonry walls abut poured concrete walls.
3. Fill slot with temporary filler or cover face opening to prevent intrusion of concrete or debris.
4. Finish: Hot-dip galvanized or zinc-plated steel.
5. Stainless steel anchors are acceptable.
6. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Heckmann Building Products,
   b. Hohmann and Barnard, Hauppauge,
   c. Pro-Slot by BoMetals, Inc.,
   d. Or approved equal.

2.4 JOINT FILLERS

A. Permanent Compressible Joint Filler:

1. Type: closed-cell expansion joint filler, ultraviolet stable, minimal moisture absorption, non-impregnated, nonstaining and nonbleeding, inert and compatible with cold-applied sealants.
2. Location of Use: Slabs and curbs as indicated on Drawings or required.
3. Thickness: As indicated on Drawings or required.

B. Temporary Compressible Joint Filler:

1. Type: White molded polystyrene beadboard.
2. Location of Use:
   a. In slabs, curbs, and walls which must be removed prior to joint sealant installation.
   b. Vertically to isolate walls from columns or other walls.

C. Semi Rigid Joint Filler:
1. Products: Subject to compliance with requirements, provide one of the following:
   a. Euclid Chemical Company “Euco 700” or “Euco QWIKjoint 200”
   b. Sika Corporation “Sikadur 51 SL”
   c. W.R. Meadows Sealtight “Rezi-Weld Flex”qual
   d. Or approved equal.

D. Noncompressible Joint Filler:
1. Type: rigid closed-cell extruded polystyrene board, square edges, 40 psi (275kPa) compressive strength, ASTM C 578, Type IV.

2. Thickness: As indicated on Drawings.
3. Location of Use: As indicated on Drawings or required.

E. Asphalt-Impregnated Joint Filler:

1. Thickness: ½" (12mm) maximum, as indicated on Drawings or required.
2. Location of Use: Sidewalks at foundation walls and as indicated on Drawings or where required.
3. Basis-of-Design Product: Subject to compliance with requirements, provide W.R. Meadows Asphalt Expansion Joint Filler, preformed, ASTM D 994, or comparable product by one of the following:
   a. Tremco
   b. Menards
   c. Or approved equal.

F. Asphalt-impregnated fiberboard expansion joint filler for interior work:

1. Type: ASTM D1751.

G. Self-expanding cork board expansion joint filler for exterior work:

1. Type: ASTM D1752.

H. Construction Joints:

1. Type: Tongue and groove type profile of galvanized steel, with knock-out holes at 6" on center to receive dowelling, complete with anchorage.

2.5 WATERSTOPS

A. Preformed Swellable Waterproofing Strips especially formulated for concrete cold joints at footings, walls, or slabs. Self-Expanding Strip Water-stops: Flexible strip of bentonite (granular bentonite clay [sodium bentonite], minimum 85% montmorillonite (hydrated aluminum silicate), with a minimum 90% passing a 20 mesh sieve) waterproofing compound in cartridge or coil form, designed specifically for vertical and horizontal joints in concrete construction. Split face type

1. Size: 3/4" (20mm) by 3/8" (10mm) strips minimum, 25 ft. (7.5m) long, and weighing at least 0.165 lbs/ft (0.245kg/m).
2. Location of Use: Concrete cold joints at footings, walls and slab joints.
3. Comply with manufacturer product application and installation instructions.
4. Product: Subject to compliance with requirements, provide products by one of the following:
   a. "Volclay Waterstop RX" by CETCO Building Materials Group,
   b. "Adcor ES" by W. R. Grace & Co.,
   c. "Hydrotite" by Sika,
   d. Or approved equal.

2.6 VAPOR RETARDER

A. Vapor retarder must have the following qualities:
   1. Maintain permeance of less than 0.03 Perms [grains/(ft^2 · hr · inHg)] as tested in accordance with mandatory conditioning tests per ASTM E1745 Section 7.1 (7.1.1-7.1.5).
   2. Other performance criteria:
      a. Strength: ASTM E1745 Class A.
      b. Thickness: 10 mils minimum
   3. Provide third party documentation that all testing was performed on a single production roll per ASTM E1745 Section 8.1
   4. Product: Subject to compliance with requirements, provide products by one of the following:
      a. Stego Wrap Class A Vapor Retarder by Stego Industries LLC.,
      b. PERMINATOR 10 mil by W. R. MEADOWS.
      c. Pro Crawl Barrier by Americover
      d. Or approved equal

B. Vapor Retarder Accessories: Tape Seams with High Polyethylene Tape with pressure sensitive adhesive, min width 4" by selected manufacturer. Seal all Penetrations of the Vapor Retarder and provide edge seal.

C. Pipe Collars: construct pipe collars from vapor retarder material and pressure sensitive tape per manufacturer's instruction.

PART 3 – EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 FABRICATION

A. Reinforcing Steel Fabrication:

   1. Fabricate in accordance with approved shop Drawings, ACI 315 and Contract Documents.
   2. Heating of Reinforcement: Will be permitted only with specific prior approval of the Commissioner.
   3. Welding: Comply with ANSI/AWS D1.4; use E9018 electrodes or approved electrodes.
   4. Tolerances: Comply with ACI 117.
   5. Unacceptable Materials: Reinforcement with any of following defects will not be permitted in Work.

      a. Bar lengths, depths, and bends exceeding ACI fabrication tolerances.
      b. Bends or kinks not indicated on Drawings or final shop drawings.
      c. Bars with reduced cross-section due to excessive rusting or other cause.

B. Welded Wire Reinforcement:

1. Type: As fabricated in accordance with CRSI, unless otherwise noted.

C. Templates:

1. Required for all footing and column dowels, and where required for proper alignment of reinforcing.

D. Assemblies:

1. Fabricate and assemble structural steel items in shop in conformance with AISC and AWS D1.1. Shearing, flame cutting, and chipping must be done carefully and accurately. Cut, drill, or punch holes at right angles to the surface of the metal. Do not make or enlarge holes by burning. Holes must be clean-cut without torn or ragged edges.
2. Welding of deformed bar anchors and headed stud anchors must be installed by full-fusion process.
3. Welding of reinforcement must be done in accordance with AWS requirements. Welding must be performed subject to the observance and testing by Testing Agency.
4. Galvanizing where required, must be applied after fabrication and prior to casting concrete.
5. Welding of crossing bars (tack welding) for assembly of reinforcement is not permitted without use of weldable reinforcement and express written consent of Commissioner.

3.3 INSTALLATION OF REINFORCEMENT

A. General:

1. Perform the work of this section in accordance with approved shop drawings, ACI 318 and CRSI recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as specified.
2. Before placing reinforcement steel, inspect forms for proper fitting and compliance with allowable tolerances.
3. Reinforcement must be free of form coatings, sealers, powdered and scaled rust, loose mill scale, earth, ice, and other materials which will reduce or destroy bond with concrete.
4. Do not place concrete until the completed reinforcement steel work has been observed and accepted by the Testing Laboratory.
5. Reinforcement steel is not permitted to be "floated into position".
6. Bend bars cold.

    a. Do not heat or flame cut bars.
    b. No field bending of bars partially embedded in concrete is permitted, unless specifically approved by the Commissioner and tested by an Independent Testing Agency for cracks.

7. Weld only as indicated.

    a. Perform welding per ANSI/AWS D12.1 and/or ANSI/AWS D1.4.
    b. See structural Drawings for additional requirements.

8. Tag reinforcement steel for easy identification.

B. Placement of Reinforcement Bars:

1. Comply with approved shop drawings, ACI 318 and Contract Documents.
2. Accurately position, support and secure reinforcement in a manner to prevent displacement before and during placement of concrete.

    a. Place reinforcement bars within tolerances specified in ACI 117.
    b. Locate and support reinforcement by metal chairs, runners, bolsters, spacers, hangers and other accessories for fastening reinforcing bars and welded wire reinforcement in place.

3. If bars are displaced beyond specified tolerance when relocating the bars to avoid interference with other reinforcement or embedded items, immediately notify the Commissioner for approval prior to concrete placement.
4. Avoid cutting or puncturing vapor barrier during reinforcement placement.

    a. Repair damage before placing concrete.

5. Concrete Coverage: Maintain concrete cover around reinforcement as indicated on Drawings.
6. Bar Supports: Use type specified in this section.
7. Tie Wires: After cutting, turn tie wires to the inside of section and bend so that concrete placement will not force ends to be exposed at face of concrete.

C. Placement of Wire Reinforcement:

1. Install in lengths as long as practicable.
2. Support in position adequately to prevent bending of reinforcement between supports before and during placement of concrete.
3. Overlap the wire reinforcement 6” or one panel width + 2”, whichever is larger.

    a. Securely tie together with wire.

4. Offset laps of adjoining widths to prevent continuous laps in either direction.
5. Locate wire fabric in the top third of slabs, unless noted otherwise on structural Drawings.

D. At Construction Joints:

1. Reinforcement bars and wire reinforcement must be continuous through construction joints, unless otherwise indicated on Drawings. See Drawings for scheduled lap splices.

E. At Expansion Joints:

1. Reinforcing bars and wire fabric must not be continuous through expansion joints, unless otherwise indicated on Drawings.

F. Splicing:

1. Unless otherwise indicated on Drawings provide lap splices for bar sizes #11 (ø36) and smaller by lapping ends, placing bars in contact, and tying tightly with wire in accordance with requirements of ACI 318 for lap lengths indicated on Drawings.
2. At all #14 (ø43) and #18 (ø57) bars and where mechanical splices are specifically indicated on Drawings, comply with requirements specified in this Specification section under "Mechanical Splicing Systems".
3. Do not splice reinforcement except as indicated on structural Drawings.
4. Tension couplers may be used and installed per manufacturer's specifications where indicated on Drawings or as approved by the Commissioner.

G. Dowels in Existing Concrete:

1. Install dowels and dowel adhesive in accordance with supplier's recommendations.
2. Minimum embedment length must be 12 bar diameters, unless noted otherwise.

3.4 INSTALLATION OF POST-INSTALLED ADHESIVE ANCHORS

A. General:

1. Post-installed adhesive anchors must be installed in accordance with the Manufacturer's Printed Installation Instructions (MPII).
2. The adhesive anchors must be supplied as an entire system. The contractor must provide all equipment required to install the adhesive anchor in accordance with the MPII.
3. Anchors must be installed in holes drilled with a rotary impact hammer drill with carbide bit. Contractor must obtain prior written approval from Commissioner before using rock drilling or core drilling installation methods.
4. Anchor holes must be thoroughly cleaned and dry prior to adhesive injection, in accordance with the MPII. Anchors to be installed in the adhesive must be clean, oil-free, and free of loose rust, paint, or other coatings.
5. Concrete must have a minimum compressive strength of 2500 psi (17MPa).
6. Concrete at time of adhesive anchor installation must have a minimum of 21 days.
7. Concrete temperature at the time of adhesive anchor installation must be at least equal to manufacture's requirements, or 50° F (10°C) if no requirement exists.
8. Support the anchor and protect it from disturbance or loading for the full cure time stated by the manufacturer at that base material temperature.
9. Unless specified otherwise in the contract documents, anchors must be installed perpendicular to the concrete surface. Anchors displaced or disturbed prior to the adhesive cure time must be considered damaged and reported to the Commissioner.
10. Locate, by non-destructive means, and avoid all existing reinforcement prior to installation of anchors. If existing reinforcement layout prohibits the installation of anchors as indicated in the drawings, the contractor must immediately notify the Commissioner.
11. Reinforcement bars or all-threaded bars must not be bent after being adhesively embedded in hardened, sound concrete, unless written approval is given by the Commissioner.

12. All personnel installing anchors must be instructed by the manufacturer on proper installation techniques. Submit for record certificate from instruction documentation from the manufacturer for each installer on this Project.
13. Installation of adhesive anchors horizontally or upwardly inclined and anchors that are designated with a (CERT) after the anchor call-out, must be performed by personnel certified by the ACI/CRSI Adhesive Anchor Installer Certification program. Submit for record certificate from ACI-CRSI Adhesive Anchor Installation Certification Program for each certified installer on this Project.

3.5 INSTALLATION OF ACCESSORIES AND EMBEDDED ITEMS

A. Install concrete accessories in accordance with manufacturer's published instructions and Contract Documents.

1. Set and secure embedments, including embedded plates, bearing plates, and anchor rods, per approved setting drawings and in such a manner to prevent movement during placement of concrete and to allow removal of formwork without damage.
2. Tolerances: Anchor rod and other embedded items placement tolerances must comply with AISC 303, “Code of Standard Practice”, Section 7.5.
3. Inspect locations to receive concrete accessories.
4. Immediately notify the Commissioner in writing of conditions that will adversely affect the Work or fails to meet Contract Document requirements.
5. Do not place concrete until reinforcement, accessories and other built-in items have been inspected and accepted by the Testing Agency.

B. Construction and Contraction (Control) Joints:

1. Construction and contraction (control) joints indicated on Drawings are mandatory and must not be omitted.

   a. Provide construction joints in accordance with ACI 318.
   b. Roughen surface at construction joints as indicated on the drawings.
   c. Where specifically indicated on drawings, provide 1-1/2” deep key type construction joints at end of each placement for slabs, beams, walls and footings.

      1) Bevel forms for easy removal.

2. Provide waterstops in construction joints in sizes to suit joint.
3. Install waterstops to form continuous diaphragm in each joint.
4. Support and protect exposed waterstops during progress of Work.
5. Field-fabricate joints in waterstops according to manufacturer’s printed instructions.

C. Coordinate the installation of pipes, bolts, hangers, anchors, flashing and other embedded items with the work of other trades.

END OF SECTION 03 15 00

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 03 30 00-CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes: all labor, materials, equipment, services, and transportation required to complete all concrete work as shown on Drawings, as specified herein, and as required by the job conditions.

B. Related work specified in other sections:

1. Section 03 15 00 Concrete Accessories
2. Section 03 35 43 Polished Concrete Finishing

1.3 APPLICABLE SPECIFICATIONS AND CODES

A. Perform all work in accordance with the latest editions and revisions of the following standards which hereby become part of this section:

1. American Society for Testing and Materials (ASTM): ASTM specifications must apply to any and all materials for which an ASTM standard has been established unless otherwise specified. The manufacturer or supplier of each material must certify that the material conforms to the applicable ASTM specification.

a. C31 Standard Method of Making and Curing Concrete Test Specimens in the Field.
b. C33 Standard Specification for Concrete Aggregates.
c. C39 Standard Test Method for Compressive Strength of Cylindrical Specimens.
d. C42 Standard Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
e. C94 Standard Specification for Ready-Mixed Concrete.
f. C143 Standard Test Method for Slump of Portland Cement Concrete.
g. C150 Standard Specification for Portland Cement.
h. C172 Standard Method of Sampling Fresh Concrete.
i. C173 Standard Method of Test for Air Content of Freshly Mixed Concrete by the Volumetric Method.
j. C192 Standard Method of Making and Curing Concrete Test Specimens in the Laboratory.
k. C260 Standard Specification Air-Entraining Admixtures for Concrete.
l. C330 Standard Specification for Light Weight Aggregates for Structural Concrete.

m. C404 Standard Specification for Aggregates for Masonry Grout.
n. C494 Standard Specification for Chemical Admixtures for Concrete.
o. C567 Standard Test Method for Unit Weight of Structural Light Weight Concrete.

2. American Concrete Institute (ACI)

a. ACI 117 Standard Tolerances for Concrete Construction and Materials.
b. ACI 211.1 Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
c. ACI 211.2 Standard Practice for Selecting Proportions for Structural Lightweight Concrete.
d. ACI 214 Evaluation of Results of Tests used to Determine the Strength of Concrete.
e. ACI 301 Specifications for Structural Concrete for Buildings.
f. ACI 302.1R Guide for Concrete Floor and Slab Construction.
g. ACI 304R Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
h. ACI 304.2R Pumping.
i. ACI 305R Hot Weather Concreting.
j. ACI 306.1R Cold Weather Concreting.
k. ACI 308 Standard Practice for Curing Concrete.
l. ACI 309R Guide for Consolidation of Concrete.
m. ACI 318 Building Code Requirements for Reinforced Concrete.
n. ACI 347 Recommended Practices for Concrete Formwork.

B. All work must be performed to secure for the entire job homogeneous concrete having required strength, durability, and weathering resistance, without any weakness or other structural defects and free of pronounced homogeneous air pockets, voids projections, offsets from plane, and other defacements on exposed surfaces.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 “Submittal Procedures.”

1.5 ACTION SUBMITTALS

A. Product Data:

1. Submit manufacturers' standard specifications, test data, and installation instructions for each product, edited to correlate to specific job requirements.

B. Shop Drawings:

1. Scope: Shop drawings must be prepared showing detail layouts of reinforcing, including dimensions, openings, and spacing, bending details, bar schedules, and similar items including water-stops, required for the proper construction of the work. Provisions for the connection of work by other trades must be indicated on the shop drawings. The location of all embedded items must be

indicated on the shop drawings. All shop drawings must be submitted for approval in accordance with the requirements of the Contract Documents.

2. Construction Joints: Submit layout showing proposed location of construction joints.

C. Samples:
1. Form ties and spreader.
2. Samples of Architectural Exposed Concrete

D. Design Mixes: All design mixes, including architectural concrete, must be proportioned in accordance with Section 5.3, "Proportioning on the Basis of Field Experience and/or Trial Mixtures" of ACI 318. The mix designs must be submitted for review on the mix design submittal form at the end of this specification. Design mixes proportioned by trial mix method must be developed by a testing laboratory and approved by the Commissioner.

E. Tolerance Compliance: Reports as per ACI 302.1R

F. Description: Submit a complete description of the system proposed for meeting the specified floor slab flatwork tolerances.

G. Lightweight Aggregate: Submit certification that the lightweight aggregate meets requirements specified for coarse aggregate under Paragraph “Materials”. In addition, submit certification, based on independent laboratory test reports, showing compliance with the following:
1. Soundness: Maximum loss of 15% when tested in accordance with ASTM C88.
2. Absorption: Maximum 15%.

H. Certification for Admixtures: Each admixture manufacturer must submit certification that admixture utilizes in the Work complies with specified requirements and to the appropriateness of the use of their admixture(s) in the combination, dosages, batching, and construction procedures proposed. In addition each admixture manufacturer must certify that their admixture is non-corrosive based upon long term testing.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 “Quality Requirements.”

B. Design Mixes
1. Normal Weight Structural Concrete: As designated on the structural drawings.
2. Lightweight Concrete: As designated on structural drawings.
3. Air Content: All concrete exposed to freezing and thawing and/or required to be watertight must have an air content of 4.5% to 7.5%. All other concrete must have an maximum air content of 3%. If trial batches are used, testing must include at least four different water-cement ratios and at least six specimens for each water-cement ratio. Two of these cylinders must be broken at seven days and the remainder at 28 days. Provide watertight concrete (air-entrained 4% with water cement ratio = 0.45) at tunnel between lines 36 and 38, auditorium walls below EL. 253 along Grid Line E retaining wall, and where crystalline waterproofing is used.

4. Strength Curve for Trial Batches: From the preceding results, for each concrete mix, a smooth curve must be drawn using the average 28 day concrete strengths as ordinates and the corresponding water-cement ratios as abscissas. The water-cement ratio for the proposed mix design must achieve an average strength 1200 psi greater than the required strength (f'c). When concrete strengths higher than 5000 psi are used, the required over-design factor must be 1400 psi.
5. Slump: Concrete design mixes must be proportioned to meet the following slump limitations:
   a. Concrete without high range superplasticizer:
      1) Beam, Columns - 3" Max
      2) All other concrete - 4" Max
   b. Concrete with high range superplasticizer: Concrete must arrive at job site with a slump of 2" to 3" for normal weight concrete and 4" lightweight concrete. Slump must be verified, then after addition of high range superplasticizer admixture, the concrete must have a maximum slump of 8" unless otherwise approved by the Commissioner.
6. Brands of Cement: The brand, color and type of cement used throughout the job must be the same as that employed in the preliminary tests.
7. Aggregates: The source of supply of the aggregates used throughout the job must be the same as that employed in the preliminary tests. Should the aggregate characteristics change materially, new water-cement ratios must be established by additional testing, as hereinbefore outlined, at the Contractor's expense.
8. Water Cement Ratio: All concrete subjected to exposed to freezing and thawing in moist condition and/or required to be watertight must have a maximum water-cement ratio of 0.45. All reinforced concrete exposed to deicing salts, brackish water seawater or spray from these sources, must have a maximum water-cement ratio of 0.40. All other concrete must have a maximum water cement ratio of 0.50.
9. Mix Design Approval: Concrete must not be placed until mix designs including material tests are submitted to and approved by the Commissioner.
10. Make one test for each design mix to verify that the total chloride (CI) ion content is within the specified limits. Perform chloride tests in accordance with ACI 318.
11. Mix design reports for concrete specified to be air entrained must include ASTM C173 test results.
12. Lightweight concrete preliminary mix design reports must include ASTM C567 test results confirming specified air-dry unit weight and establishing a fresh unit weight to be used in field control. Lightweight concrete mix design(s) must be reviewed by the lightweight aggregate manufacturer. The aggregate manufacturer must certify, as part of the preliminary mix design report, that the proposed mix design(s) are appropriate considering the physical properties of the aggregate, the concrete supplier's procedures for storage and handling of the aggregate, the intended method of concrete placement and the procedures specified for quality control.

C. Field Tests and Inspection:

1. Concrete Samples: The Commissioner reserves the right to take samples from any or every lot of concrete delivered to the job. Any rejected concrete must be immediately removed from the work.

2. Concrete Placement: All controlled concrete, including the placement of the reinforcing and the placing of the concrete, is to be inspected by the Commissioner's representative and/or testing laboratory. Any concrete rejected due to failure to meet specification requirements must be removed by the contractor at own expense.

3. Inspections must include:

   a. Compression Tests: The Testing Laboratory will supply all molds required for tests as described below, using molds of the same type and manufacture for making all test specimens. A minimum reserve of 25 additional standard molds must be available at the site at all times for making additional test specimens as may be directed by the Commissioner. The testing laboratory will take specimens of each class of concrete beginning with the first truck and as follows:
      1) At least four (4) specimens for each 50 cu. yds. or fraction thereof of each class of concrete and in any case not less than four (4) specimens for any one day's operations must be sampled directly from the mixer.
      2) In addition to specimens sampled directly from the mixer, test cylinders for pumped concrete and superplasticized concrete must also be made from concrete sampled at the point of deposit or as directed by the Commissioner designated for inspection. These test cylinders must be separate and distinct from those made from the mixer, and must be made from the same batch and cured and tested in the same manner as described for the samples taken from the mixer. The number of test cylinders made from concrete sampled at the point of deposit must be a minimum of one set of 2 cylinders for every 150 cu. yds. or fraction thereof for each class of concrete mixed in any one-day's concreting. When concrete is being placed directly from the mixer into the forms without any intermediate conveyance, the additional cylinders will not be required.
      3) Samples will be obtained in accordance with ASTM C172.
      4) The testing laboratory will comply with ASTM C31 in making, curing and subsequently handling test specimens, except as modified herein. Specimens will be tested in accordance with ASTM C39.
      5) For specimens sampled directly from the mixer, the cylinders will be placed in laboratory storage under moist curing conditions at approximately 70 deg. F. within 24 hours after molding and maintained therein until tested. One specimen on each set will be tested at seven days. If the seven-day strength is below 60% of design strength the commissioner will be immediately notified. Two cylinders of each set will be tested at 28 days. The fourth cylinder of each set must be a reserve cylinder for testing at 56 days if the average 28 days strength does not meet specified strength.
      6) For specimens sampled at the point of deposit, cylinders will be stored and maintained as above and will be tested at 28 days.
      7) Air Content: Test cylinders in accordance with ASTM C173. For air-entrained concrete, test each sample taken. For concrete not air-entrained,
         test every 100 cu. yds. at random or at least one cylinder per day.
      8) Unit Weight: Test one cylinder per day in accordance with ASTM C138 for normal weight concrete or ASTM C567 for lightweight concrete.
         a) First truck everyday and each sample for cylinders.
      9) Slump: Test in accordance with ASTM C143.
         a) Test each sample taken for cylinders. For containing superplasticizer added at the site, one test must be made prior to addition of the admixture, and another test after addition and mixing. For pumped concrete, one test must be made at the pump and one at the point of deposit. Provide slump cone(s) and rod(s) for use on the job at all times.

b. Recording air temperature, concrete temperature, unit weight of concrete, amount of entrained air, and slump for each batch of concrete.

c. Testing of aggregate gradation and moisture content, monitoring material batching at the concrete plant.

d. Inspection of placement of reinforcing steel and supporting devices. Contractor must not place concrete until reinforcing steel has been inspected and approved, by Commissioner or approved testing agency.

e. Inspection of compliance with specification requirements, including proper conveying, protection during periods of hot or cold weather, vibration and curing of concrete.

f. Rejection of concrete not meeting specification requirements and immediate report to the Commissioner.

g. Obtaining certified mill test results for each load of cement delivered to the concrete producer for use of this project.

h. Preparation of daily reports of testing and submission of results in triplicate to the Commissioner daily.

4. Chloride: At beginning of the job make 3 tests; one each for 100 cubic yards to be carried out to verify that chloride level meet the ACI 318 specification. The testing laboratory must take specimens of each class of concrete and will perform one test for each 1000 cu. yds. (or fraction thereof) to verify that the total chloride ion content are within the specified limits. If the total chloride ion content exceeds the specified limits, the testing laboratory must perform, at the Contractor's expense, a water soluble chloride ion test in accordance with ACI 318.

5. Flatwork Tolerances: The Testing Agency will survey the finished floor surfaces in a manner agreed to by the Commissioner to verify compliance with the flatwork tolerances specified. Perform tests in accordance with ACI 302.1R within 24 hours of concrete placement and submit results within 72 hours with deficiencies noted if any.

6. Cooperation: The Contractor must provide assistance and reasonable facilities for use by the Commissioner and testing laboratory inspector.

D. Tests on Questionable Concrete:

1. If the results of tests and/or inspections indicate the concrete and/or steel reinforcement or construction techniques do not meet the requirements as set forth on the drawings in these Specifications and as determined by Commissioner, due to inadequate batching, placing, curing or protection, Contractor must proceed as directed by Commissioner.

2. Additional Tests: The Commissioner has the right to order the Contractor to make load tests, compression tests on specimens taken from the in-place concrete, or any other tests of the completed

structure or any part thereof. The Contractor, at own expense must remove any condemned concrete and replace same with new concrete to the satisfaction of the Commissioner.

1.7 PRE-CONCRETE CONFERENCE

A. Prior to start of the concrete construction schedule, the Contractor must conduct a meeting to review the proposed mix designs and to discuss the required methods and procedures to achieve the required concrete properties. The Contractor must send a Pre-concrete conference agenda to all attendees and to the Commissioner 10 days prior to the scheduled date of the conference.

1. The Contractor must require responsible representative of every party who is concerned with the concrete work to attend the conference, including but not limited to the following:
   a. Contractor's superintendent.
   b. Laboratory responsible for the concrete design mix.
   c. Laboratory responsible for field quality control.
   d. Concrete subcontractor - ready mix concrete producer.
   e. Admixture manufacturer(s).
   f. Concrete pumping subcontractor.
   g. Commissioner.

2. Minutes of the meeting must be recorded, typed and printed by the Contractor and distributed to all parties concerned within 5 days of the meeting. One copy of the information must also be transmitted to the Commissioner.

3. The minutes must include a statement by the admixture manufacturer(s) and concrete subcontractor indicating that the proposed mix design and placing techniques can produce the concrete quality required by these specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cement: Portland cement, Type I or II, unless noted otherwise, of approved manufacturer, fresh stock, meeting requirements of ASTM C150 or ASTM 1157, Type GU or LH. Air-entraining cement will not be permitted. Chloride ion content should not exceed 0.15% of the weight of cement. The alkali content must not exceed 0.6% when tested in accordance with ASTM C114 unless either one of the following requirements is satisfied:

1. The manufacturer certifies that no alkali reactivity is produced with the proposed combination of materials when tested in accordance with ASTM C227, or

2. A pozzolan, complying to ASTM C618 proven by testing in accordance with ASTM C441, to be effective in preventing excessive expansion due to alkali-aggregate reaction, is included in the mix. Furnish test reports.

3. Fly ash (ASTM C989) or recycled glass pozzalans maximum 30 percent of cement requirement except for architectural exposed concrete.

4. Provide material with an initial SRI of .33 at installation.

B. Concrete Aggregates for Normal Weight Concrete

1. Fine and coarse aggregates for normal weight concrete must conform to ASTM C33. Aggregates must have hard, angular, strong, clean uncoated, durable particles and must be free of injurious amounts of thin elongated pieces, mica, clay, silt, and organic matter.

2. Fine aggregate must be natural sand or stone screenings. Note that the fineness modulus must not vary by more than .20FM throughout the work.

3. Coarse aggregate must be crushed stone or gravel, meeting gradation requirements for Size no. 67 (3/4-inch to No. 4).

4. Combined aggregate gradation for slabs and other designated concrete must be 8% - 18 large top size aggregates (1 1/2 in.) or 8% - 22% for smaller top size aggregates (1 in. or ¾ in.) retained on each sieve below the top size and above the No. 100.

5. The acceptability of aggregates for the work will depend on proof that their potential alkali reactivity is not deleterious to the concrete.

6. Aggregates must be free of deleterious substances, including material that could react harmfully with alkalis in the cement. Tests must be submitted as per ASTM C117, C142, C123, C40, C289, or C227.

7. Soundness: Acceptable results of ASTM C88 for aggregate soundness must be submitted.

8. Aggregate Sources: Provide aggregate from one source of supply only.

C. Concrete Aggregates for Lightweight Concrete: Lightweight concrete aggregate must be expanded shale, clay, or slate conforming to ASTM C-330 for lightweight aggregates. All lightweight aggregate must be produced by the rotary kiln process and must be Solite type. ASTM certification data must have been completed within two years of submission to the Commissioner. Aggregate must contain the minimum absorbed moisture content (14% internal moisture content) recommended by the manufacturer for the project prior to batching. The lightweight aggregate must have a proven record of performance and have a loss not greater than ten (10) percent when tested with magnesium sulfate in accordance with ASTM C-88. Concrete made from lightweight aggregate with a cement content of six (6) bags per cubic yard and approximately 6% air content must have a minimum durability factor of 85% when tested in accordance with ASTM C-666. (latest revision).

1. The lightweight aggregate producer must make available to the Commissioner tests conducted in accordance with ASTM C-496 indicating tensile splitting strength on concrete composed of coarse aggregate and natural sand. Test values must exceed 0.85 as called for in ACI 318 for the particular compressive strength. (0.75for all - lightweight concrete).

D. Water: Water for concrete must be potable, clean and free from all organic materials, strong acids or alkalis and must conform to ASTM C-94.Concrete Admixtures: Provide only those admixtures which produce no detrimental efforts on metal components such as form deck, reinforcing, embedment and conduit. Admixtures, which when combined with other ingredients used to produce the concrete must result in concrete having not more than the specified limits for soluble chloride ion content.

1. Water-Reducing Admixture: The admixture must conform to ASTM C494, Type A, and not contain more than 0.05 percent chloride ions.

   a. Product: Subject to compliance with requirements, provide one of the following:
      1) "WRDA" w/ Hycol"; W.R. Grace & Co.
      2) "Eucon WR-75 or WR-89; The Euclid Chemical Company.
      3) "Plastocrete 161"; Sika Chemical Corporation.
      4) "Pozzolith A322N or 220N Master Builders.
      5) Or approved equal.

2. Water-Reducing, Retarding Admixture: The admixture must conform to ASTM C494, Type "D", and not contain more than 0.05 percent chloride ions.

   a. Product: Subject to compliance with requirements, provide one of the following:
      1) "Eucon Retarder - 75"; The Euclid Chemical Co.
      2) "Daratard 17"; W.R. Grace & Co.
      3) "Plastiment"; Sika Chemical Corp.
      4) "Pozzolith 100-XR"; Master Builders.
      5) Or approved equal.

3. Non-corrosive, Non-chloride Accelerator Admixture: The admixture must conform to ASTM C494, Type "C" or "E" and not contain more than 0.05 percent chloride ions. The admixture manufacturer must have long-term non-corrosive test data from an independent testing laboratory (of at least a year's duration) using an acceptable accelerated corrosion test method such as that using electrical potential measures.

   a. Product: Subject to compliance with requirements, provide one of the following:
      1) "Accelguard 80"; The Euclid Chemical Co.
      2) "Daraset"; W.R. Grace & Co.
      3) "Pozzutec-20"; Master Builders.
      4) "Plastorcrete 161 FL"; Sika Chemical Corp.
      5) Or approved equal.

4. Air-Entraining Admixture: The admixture must conform to ASTM C260 and be certified by the manufacturer to be compatible with other required admixtures.

   a. Product: Subject to compliance with requirements, provide one of the following:
      1) "Air-Mix"; or “AEA-92” The Euclid Chemical Co.
      2) "Sika Aer"; Sika Chemical Corporation.
      3) MBAE-90; Master Builders.
      4) "Daravair"; W.R. Grace & Co.

5) Or approved equal.

5. Silica Fume Admixture: Silica fume admixture must consist of a silica fume pozzolanic material containing a high content of amorphous silicon dioxide (90 to 95 percent) meeting the requirements of ASTM C618-78, Class S.

   a. Product: Subject to compliance with requirements, provide one of the following:
      1) "Force 10,000"; W.R. Grace & Co.
      2) "Eucon MSA"; The Euclid Chemical Co.
      3) "Rheomac SF100"; Master Builders.
      4) Or approved equal.

6. Corrosion Inhibiting Admixture: 30% Calcium nitrite (where called for on drawings) The admixture must conform to ASTM C494, Type "C" and not contain more than 0.05 percent chloride ions. The admixture must be used at dosages of 3 gallons per cubic yard for all cast-in-place and parking levels concrete.

   a. Product: Subject to compliance with requirements, provide one of the following:
      1) "Armatec 2000"; Sika Chemical Corp.
      2) "Rheocrete NCI"; Master Builders.
      3) “Eucon CIA”, The Euclid Chemical Co.
      4) Or approved equal.

7. Prohibited Admixtures: Calcium chloride, thiocyanate or admixtures containing more than 0.05% chloride ions are not permitted.

8. Certification: Written conformance to the above-mentioned requirements and the chloride ion content of the admixture will be required from the admixture manufacturer prior to mix design review by the Commissioner.

E. Admixture Usage:

1. All concrete must contain a specified water-reducing admixture or a specified high-range water-reducing admixture or both (Superplasticizer).

2. All concrete placed at air temperatures below 50 degrees F must contain the specified non-corrosive, non-chloride accelerator.

3. All concrete required to be air entrained must contain an approved air-entraining admixture.

4. Refer to contract drawings for specific locations but the following concrete must contain the specified high range water reducing admixture (superplasticizer):
   a. Pumped Concrete.
   b. Industrial Slabs.
   c. Parking level concrete (and concrete for associated curbs and areas subject to deicing salts).
   d. Architectural Concrete (exposed).

e. Concrete required to be watertight even when treated with a membrane or additional protection.
f. Concrete with a water-cement ratio below 0.45.

F. Fibrous Reinforcement:

1. Fibrous Reinforcement: Monofilament or collated, fibrillated, polypropylene fibers for secondary reinforcement of concrete slabs.

   a. Product: Subject to compliance with requirements, provide one of the following:
      1) "Fibermesh"; Fibermesh Inc.
      2) "Fiberstrand 100 or 150"; the Euclid Chemical Co.
      3) "Grace Fibers" and "Grace Micro Fibers"; W.R. Grace & Co.
      4) Or approved equal.

G. Lightweight Concrete Non-Structural Fill:

1. All concrete fill must be lightweight concrete with a minimum dry weight of 100 pounds per cubic feet and must achieve a compressive strength of 3000 psi at the end of 28 days.

H. Expansion Bolts:

1. Expansion bolts to concrete, Minimum size must be 3/4" and 6" embedment into concrete and must be capable of developing the torque specified by the manufacturer.

   a. Product: Subject to compliance with requirements, provide one of the following:
      1) "Liebig International Inc.,"; Liebig Safety Bolts
      2) "Hilti Fastening Systems"; Kwik-Bolt
      3) "ITW Ramset"; Red Head Trubolt Wedge Anchors
      4) Or approved equal.

2. PTA series anchors embedded types at top of masonry walls.

   a. Manufacturers: Subject to compliance with requirements, provide one of the following:
      1) Hohmann & Barnard Inc
      2) BLOK-LOK
      3) Wire Bond
      4) Or approved equal.

I. Grout:

1. ASTM C1107, free of gas-producing or gas-releasing agents, oxidizing catalysts, inorganic accelerators and chlorides. If requested by the Commissioner, grout a sample 4 ft. x 4 ft. x ½ in. plate in the field and demonstrate a minimum of 95% bearing after curing 14 days. Cure grout in accordance with manufacturer's instructions.

2. Non-Metallic: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage compensating agents, plasticizing and water-reducing agents, of consistency suitable for application, and a 3-minute working time.

   a. Product: subject to compliance with requirements, provide one of the following:
      1) "Euco NS" (by the Euclid Chemical Co.).
      2) "Five Star Grout" (U.S. Grout Corp.).
      3) "Masterflow 928" (Master Builders Co.).
      4) "Crystex" (L&M Construction Chemicals, Inc.)
      5) Or approved equal.

2.2 CURING METHODS AND MATERIAL

A. Curing paper must be waterproof paper conforming to ASTM C-171 or opaque polyethylene film.

B. Wet Curing: Wet cure by continuous fog spray or immersion in water. Do not use curing compounds on surfaces to be wet cured. All concrete surfaces subjected to deicing salts brackish water etc., i.e., parking level slabs must be wet cured only.

C. Curing and Sealing Compound must be VOC Compliant (350 g/l): Liquid type membrane-forming curing compound, clear styrene acrylate type, complying with ASTM C1315, Type I, Class A, 25% solids content minimum. Moisture loss must be not more than 0.40 Kg/m2 when applied at 300 sq. ft./gal. Manufacturer's certification is required.

   1. Product: Subject to compliance with requirements, provide one of the following:
      a. "Super Aqua Cure or Super Diamond Clear VOX" by the Euclid Chemical Co.
      b. "Master-Kure 300W" by Master Builders
      c. Dure-M-Seal 30WB by Sonneborn/Chem Rex Inc.
      d. Or approved equal.

2.3 EVAPORATION RETARDER

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   1. "Euco-Bar" by The Euclid Chemical Co.
   2. "Confilm" by Master Builders.
   3. EVAPRE by W.R.Meadows
   4. Or approved equal.

2.4 FIELD SERVICE

A. A technically qualified representative of the admixture manufacturer must be present during the initial stages of the concrete placement with the high-range water-reducing admixture (superplasticizer) to assist the contractor and ready-mix producer to achieve the optimum benefits of this concrete under the prevailing job site conditions.

2.5 ACCESSORIES FOR CONCRETE WORK

A. Porous fill: Refer to section 31 50 00 “Excavation Support and Protection”.

B. Expansion joint fillers and isolation joint fillers must extend the full depth of slab or joint and be of the thickness shown on the drawings. Filler must be asphalt impregnated fiberboard conforming to ASTM D1751 for interior work and selfexpanding cork board conforming to ASTM D1752 for exterior work.

C. Control joint fillers must be of the same materials as expansion joint filler.

D. Vapor Barrier: Class l vapor retarder 0.1 perm or less conforming to ASTM E1745: Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs and ASTM E1643: Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.

1. Ribbed Center bulb Water-stops: Extruded virgin polyvinyl chloride, free of porosity, tensile strength 1900 psi, minimum elongation 200%, 3/16” minimum thickness, 6” minimum width and multiple rib type with loop or bulb at the center.

E. Compressible filler must be expanded polystyrene beadboard of .1 pcf min. density conforming to FSHH-1-524B.

F. Sealer/Dustproofer: The sealer/dustproofer VOC compliant must be a second coat of the previously specified clear curing and sealing compound. The compound must be applied in strict accordance with the directions of the manufacturer and just prior to completion of construction.

G. Non-Shrink Grout: The grout must conform to CRD-C-621-80, “Corps of Engineers Specification for Non-Shrink Grout”.
1. Products: Subject to compliance with requirements, provide one of the following:
   a. “Embeco 153” (metallic) by Master Builders
   b. “Masterflow 713” (non-metallic) by Master Builders
   c. “NS Grout” (metallic) by Euclid
   d. Or approved equal.

H. Patching Mortar: Free flowing, polymer modified cementitious coating,
1. Products: Subject to compliance with requirements, provide one of the following:
   a. “Euco Thin Coat” by The Euclid Chemical Company
   b. “Sikatop 121” by Sika Chemical Corporation
   c. “Meadow Patch T2” by W.R.Meadows
   d. Or approved equal.

I. Bonding Compound: The compound must be a polyenthl acetate, rewettable type.
1. Products: Subject to compliance with requirements, provide one of the following:
   a. “Euco Weld” by the Euclid Chemical Company
   b. “Weldcrete” by the Larsen Company.
   c. “Intralok” by by W.R.Meadows
   d. Or approved equal.

J. Epoxy Adhesive: The compound must be a two (2) component, 100% solids, and 100% reactive compound suitable for use on dry or damp surfaces.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. "Euco Epoxy #463 or #615" by The Euclid Chemical Company
      b. "Sikadur Hi-Mod" by Sika Chemical Corporation.
      c. "Rezi-Weld" by W.R.Meadows
      d. Or approved equal.

K. Adjustable Inserts and Expansion Bolts:Anchorage to the concrete for lintels, shelf angles, clips which require adjustability must be by means of Hot dipped Malleable Iron, long wedge type adjustable inserts and matching bolts, washers, and nuts Where indicated on drawings, inserts and also bolts, washers, nuts and shims must be galvanized. Unless otherwise shown, the bolt diameters must be ¾" inch.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Hohmann and Barnard, Inc.
      b. Richmond Screw Anchor Co.
      c. Gateway Building Products
      d. Or approved equal.

L. Anchor slots – reglets in concrete for tying brick, block or other masonry, units must be No. 22 gauge zinc coated steel felt-filled dovetail slots to match masonry anchors specified in another section. Reglets must be 25-gauge minimum sheet metal galvanized of an approved type.

M. Continuous slotted inserts must be used for hung loadings including hung partitions and mechanical equipment and must be a rolled steel insert capable of supporting a minimum of 3000 lbs./ft. Lengths must be 1-1/2 feet unless otherwise specified on drawings or herein. spacing must be as follows or as indicated on drawings.
   1. Mechanical Room: 1 per 25 square feet (i.e., 5 feet o/c.). Maximum hung load 20 psf over 1/3 the area.
   2. Under hung mechanical loads over 500 lbs. (minimum 6 inserts per HVAC units, minimum spacing 5'-0" o/c.).
   3. Products: Subject to compliance with requirements, provide products by one of the following:
      a. "Type #CS-H"; Hohman and Barnard
      b. "P3200 Series continuous inserts"; Unistrut Building Systems
      c. "Continuous slotted inserts" ;Gateway Building Products
      d. Or approved equal.

N. Expansion bolts to concrete: Minimum size must be ¾" and 6" embedment into concrete and must be capable of developing the torque specified by the manufacturer.
   1. Products: Subject to compliance with requirements, provide products by one of the following:
      a. Safety Bolts, by Liebig
      b. Kwik-Bolt by McCulloch Industries
      c. "Red Head" or self-drilling anchors by Phillips Drill Division
      d. Or approved equal.

O. Façade Support Plates and Angles: All support plates and angles must be ASTM A36 Steel. All welded reinforcement to these plates and angles will be billet steel having a yield point of 60,000 psi and conforming to ASTM Specification A615 Grade 60. All studs welded to these plates and angles

must be headed concrete anchors. Stud must have minimum yield strength of 50 walls, columns, beams, and slabs 9" thick or larger and ½" shaft diameter and 5-1/2" long for members less than 9" thick, unless otherwise shown on drawings.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Nelson Stud Welding Co.,
   b. Erico Products,
   c. Blue Arc,
   d. Or approved equal.

P. All anchor bolts for structural steel must be ASTM A36 or A307 unless otherwise noted on drawings.

Q. Joint Sealant: The sealant must be two (2) part, polyurethane sealant conforming to Federal Spec TT-S-00227E.

1. Products: Subject to compliance with requirements, provide products by one of the following:
   a. "Eucolastic II" by the Euclid Chemical Company,
   b. "Vulkem 245" by Mameco International,
   c. "Isoflex 750" by Master Builders,
   d. Or approved equal.

R. Epoxy Joint Filler: The epoxy joint filler must be a two (2) component 100% solids compound, with a minimum shore D hardness of 50.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. "Euco 700, 800 by The Euclid Chemical Company,
   b. "QWIKjoint" by The Euclid Chemical Company,
   c. "Sikadur 51 SL" by Sika Chemical Corp.,
   d. Or approved equal.

S. Penetrating Anti-Spalling Sealer: The sealer must be a siloxane-based compound which has a 92% chloride ion screen and a repellency factor of 92% chloride ion screen and a repellency factor of 92% when tested in accordance with NCHRP #244, Test Method. In addition, the sealer-treated concrete must exhibit no scaling when exposed to 125 cycles of freezing-and-thawing. The system must conform to the requirements with ASTM C957-81. The test must be by an independent testing laboratory.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. "Euco-Guard VOX by the Euclid Chemical Co.,
   b. "Euco-Guard 100" by the Euclid Chemical Co.,
   c. "Environseal" by Hydrozo Co.,
   d. Or approved equal.

T. Non-Oxidizing Metallic Floor Hardener: The specified non-oxidizing metallic floor hardener must be formulated, processed and packaged under stringent quality control at the manufacturer's owned and controlled factory. The hardener must be a mixture of specially processed non-rusting aggregate, selected portland cement and necessary plasticizing agents.

U. Underlayment Compound: Free flowing, self-leveling, pumpable cementitious base compound.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. "Flo-Top" by the Euclid Chemical Co.,

b. “Ardex K” by the Ardex Co.,
c. “Underlayment 110” by Master Builders,
d. Or approved equal.

V. Repair Topping: Latex and microsilica-modified cementitious mortar topping, which meets or exceeds the bond strength requirements of ASTM C 1059.
1. Products: Subject to compliance with requirements, provide one of the following:
a. “Thin Top Supreme” by The Euclid Chemical Co.,
b. “CD Fine” by Ardex,
c. “Final Coat” by Lambert Renew,
d. Or approved equal

W. Stair Fill and Platform Fill: Abrasive aggregate..
1. Products: Subject to compliance with requirements, provide one of the following:
a. "Non-Slip" Aggregate"; The Euclid Chemical Company.
b. "Alundum"; North Company
c. “Final Coat”; Lambert Renew
d. Or approved equal

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 MIXING AND PLACING CONCRETE

A. Measurement of Materials: Materials for controlled concrete must be measured by weighing the aggregates and cement using equipment that is suitable, designed, and constructed for this purpose. Each size of aggregate and the cement must be weighed separately. The accuracy of all measuring devices must be such that quantities be measured to within the following percentages of the desired amount: 1% for cement and water, 2% for aggregates, and 3% for admixtures. Mixing water and all admixtures must be measured by volume. Batching plant must have a proven performance record as indicated by a standard deviation no greater than 500 psi.

B. Mixing Concrete: All concrete must be machine mixed. The time of mixing must not be less than 1 minute with a peripheral speed of the drum of about 200 feet per minute for batches of one cubic yard. For larger batches, mixing must be in accordance with ASTM C94.

1. Transit mix concrete may be used provided it conforms to the specifications and tests herein described and ASTM C94, and further provided that the central plant producing the concrete and equipment transporting it are, in the opinion of the testing laboratory and contractor, suitable for production and transportation of controlled concrete.
a. The maximum elapsed time between the time of the introduction of water and discharging must be 1-1/2 hours and the maximum temperature of the concrete at discharge must be 90ºF.

b. The minimum time of mixing must be one minute per cubic yard after all material, including water, has been placed in the drum. The drum must be reversed for an additional two minutes.
c. Mixing water for controlled concrete must be added only in the presence of the Special inspector.
d. The size of the batch must not exceed the rated capacity of the mixer as stated by the manufacturer.

2. Admixtures: All admixtures must be used in strict accordance with the directions of the manufacturer. The water reducing and air entraining admixtures must be accurately dispensed at the ready-mix plant. The high range water reducing admixture (superplasticizer) must be accurately dispensed from truck mounted tanks at the job site.

C. Placing Concrete

1. Preparation: Before placing concrete, all equipment for mixing and transporting the concrete must be cleaned, all debris and ice must be removed from the places to be occupied by the concrete, wood forms must be thoroughly wetted except in freezing weather, and forms must be oiled. Aluminum chutes or pipes must not be used to convey or place concrete. Concrete on earth or fill must not be placed until the earth and fill has been approved.

2. Conveying: Concrete must be conveyed from mixer to forms as rapidly as practicable and by methods which will prevent segregation or loss of ingredients. It must be deposited as nearly as practicable in its final position. Chutes must have a slope of less than 1 Vertical to 2 Horizontal and must be arranged in such fashion that the concrete slides in them and does not flow. Where a vertical drop greater than five feet is necessary, placement must be through elephant trunks or similar devices to prevent segregation.

3. Pumping: The pumping operation must be done in strict accordance with ACI Committee 304 report, "Placing Concrete by Pumping Methods". The mix design, slumps at the pump and at the discharge end of the line, type of pump to be used, and redosage with the high range water reducing (superplasticizer) must be discussed at the Pre-Concrete Conference.
   a. Pump and Pump System:
      1) Pump lines must be of 5" minimum size, clean with mortar tight joints, and be securely anchored to prevent movement during pumping. The pump must produce the required volume at a pumping pressure lower than 1500 psi.
      2) Maximum pump piston size must be 8".
      3) Minimum rubber hose should be used at the end of line for placing.
      4) Special attention is called to the need to minimize bends in the pump line and to keep placing rates low (50-70 cy/hr) to minimize pumping pressure.
      5) Pump operator must have previous successful experience pumping structural lightweight concrete.

4. Sequence and Timing: Concrete must be placed before initial set has occurred, but in no event after it has been discharged from the mixer more than 30 minutes. All concrete must be placed upon clean, damp surfaces, free from puddled water, or upon proper consolidated fills and never upon soft mud or dry earth. The concrete must be compacted and worked into all corners and angles of the forms and around the reinforcement. Construction for forms for the lifts of vertical walls must be such as to make all parts of the walls easily accessible for the placement, spading, vibration, and

consolidation of the concrete as herein specified. Re-tempering of partly set concrete will not be permitted.

5. Vibrating: All structural concrete including supported slabs and slabs on ground must be placed with the aid of mechanical vibrators. Use and type of vibrators must be in strict accordance with ACI 309, "Recommended Practice for Consolidation of Concrete" and with sufficient intensity to visibly affect the concrete over a radius of at least two feet around the point of application. Vibrators must be used in sufficient quantity to cause all concrete to flow or settle rapidly into place with such length of application to avoid segregation. The vibrators must be of the internal type, applied directly to the concrete, except in sections too thin to permit insertion, in which case form vibrations may be employed. A spare vibrator must be kept on the job during all concrete placing operations. Lower frequency vibrators must be used with "flowing" concrete.

6. Vertical Construction Joints: All concrete in vertical members must have been in place not less than 2-1/2 hours before concrete in horizontal or vertical members resting thereon is placed. Joints in piers must be made at the underside of the deepest beam or girder framing hereto.

7. Protection of Green Concrete: After the concrete has taken its initial set, care must be exercised to avoid jarring the forms or placing any strain in the end of projecting reinforcement. Materials must not be placed or loads imposed upon slabs during the period of setting.

8. Rain: Concrete must not be placed during rain. Sufficient coverings must be provided and kept on hand for protection during rainstorms.

D. Cold Weather Concreting

1. Refer to ACI 306R "Cold Weathering Concreting".

E. Hot Weather Concreting

1. Refer to ACI 305R "Hot Weathering Concreting".

F. Construction Joints

1. Vertical Joints: Vertical construction joints must be located within the central third of the span. Any concrete spilling over or through the bulkhead must be removed at the completion of the pour. All surfaces of the concrete must have reinforcing extending through the joint. Where not otherwise shown on drawings, provide #4 bars at 12 inch o/c. x 4'-6" long.

2. Horizontal Joints: Horizontal construction joints other than those shown on the drawings will not be permitted unless approved by the Commissioner.

3. Joint Preparation: Forms must be removed in time to permit roughening by chipping and wire brushing to remove all loose and foreign material at construction joints of structural members. The joints must be dampened and the specified bonding compound applied. New concrete must be placed after the bonding compound has dried.

G. Floor Slabs on Grade

1. Floor slabs on grade must be placed to the thickness shown on the drawings on vapor barrier.

2. Placement: Slabs on grade must be placed by the long strip cast method. Refer to ACI 302 and 360 for recommended methods of placement. The maximum width of the strip must be 20 feet.

3. Embedded Pipes: Maximum outside diameter of pipe or conduit placed in slabs on grade must be limited to one-third the thickness of the slab. The minimum concrete cover top and bottom must be one-third the thickness of the slab.

4. Keying: Provide a continuous key at construction joints and continue reinforcement through joints unless construction joint is also as control joint.

5. Control Joints: Provide control joints at maximum 20 feet spacing on each direction. Control joints must be formed by saw cutting. Joints must be at least 1/4 of the slab thickness and 1/4" maximum width and must be filled with the specified control joint sealant or filler and must have discontinuous reinforcement through the joint. Saw cutting must be performed no later than 3 hours after the final troweling. All saw cuts must be aligned and continuous. Provide layout of control joints for Commissioner's approval/review for all exposed areas.

H. Stair Tread and Platform Fill

1. Mix concrete fill for steel pan-type stairs and platforms in the proportions, by weight, of one part Portland cement, 1-1/2 parts fine aggregate and 2 parts coarse aggregate. The coarse aggregate must be graded from 3/8", with at least 95% passing a 3/8" sieve, and not more than 10% passing a No. 8 of not less that 14 ga. steel wire, 2" square, supported approximately 1/2" above the bottom of pans.

2. Finishing: Make concrete filled steel pan-type stairs, platforms, and other floor landings, required to be non-slip must have the abrasive aggregate or sprinkled at the rate of 1/4 lb for each square foot of area. Abrasive aggregate must be composed of 60% to 75% of aluminum oxide abrasive bonded by a vitreous ceramic material. Use hard, homogeneous, non-glazing, rustproof aggregate, which is unaffected by moisture or cleaning compounds. After screeding the cement finish level, permit it to stand until it will bear the weight of workmen standing on boards. At this time, the abrasive aggregate, having previously been soaked in clean water for about ten minutes, must be sprinkled uniformly on the surface and immediately wood floated onto the concrete surface. Prepare a sample for the approval of the Commissioner.

3.3 CURING AND FINISHING

A. Curing Concrete.

1. Concrete, after it is placed and until the expiration of 7 days, must not be allowed to dry out. Curing may be accomplished by one of the following methods (except for surfaces exposed to deicer salts brackish water, etc, i.e., parking level slabs, which must be cured using the water curing method only), and must be initiated as soon as the concrete has attained its initial set. Where wood forms are left in place, they must be kept wet, or when forms are removed the concrete

must be cured for a total of seven days from the time of placing has elapsed. Prior to placing concrete, the contractor must submit the proposed curing method or methods for the various components of the structure to the Commissioner for approval. Curing method must be compatible with finishes to be applied.

a. Water curing must be accomplished by keeping the surface of the concrete wet by covering with water, or with approved water saturated covering.
(Note that this method precludes work upon surface for seven (7) days.)
b. Waterproofed Curing Paper: Curing may be accomplished by sealing in the water as above specified by covering with an approved waterproofed curing paper laid with airtight joints. Paper must be securely positioned to prevent displacement by wind and protected from tearing or other injury.
c. Curing and Sealing Compound: All interior slabs with resilient tile, carpet or left exposed and all exterior slabs, sidewalks, curbs, must be cured with the specified clear curing and sealing compound. The compound must be applied immediately after final finishing by roller or power spray.
Maximum coverage must be 400-sq. ft. per gallon for steel troweled finishes, and 300-sq. ft. per gallon for floated or broomed finishes must be compatible with future applied finishes.

B. Finishing Formed Concrete

1. Exposed Surfaces To Be Finished: Formed concrete surfaces scheduled to receive plaster or a painted finish must, as soon as the forms are removed, have all fins and projections removed, off-sets leveled, and all voids and damaged places saturated immediately with water, filled with neat cement mortar mixture, and brought to an even surface by means of a wood spatula or float. Where necessary to provide a smooth, even finish, the surface must be rubbed with a carborundum brick.
2. Exposed Concrete Without Additional Finish: Formed concrete surfaces exposed in unfinished areas must have all fins and projections removed, and all voids filled with neat cement mortar. All concrete exposed to view must be formed to provide a smooth, even surface free from visible bulges, indentations, nail heads, joints, cracks, honeycombs, or other imperfections.
3. Concealed Concrete: Formed concrete surfaces in hung ceilings must have all voids filled with neat mortar.

C. Concrete Slab Finishes

1. Floated Finish
a. Sequence: After the concrete has been placed, struck off, consolidated, and leveled, the concrete must not be worked further until ready for floating. Floating must begin when the water sheen has disappeared, and/or when the mix has stiffened sufficiently to permit the proper operation of a power-driven float.
b. Method: The surface must then be consolidated with power-driven floats of the impact type. Hand floating with wood or cork-faced floats must be used in locations inaccessible to the power-driven machine. Trueness of surface must be rechecked at this stage with a 10-foot straightedge applied at not less than two different angles. All high spots must be cut down and all low spots filled during this procedure. The slabs must then be refloated immediately to a uniform, smooth, granular texture and FF 20/FL 17 to tolerance.

2. Troweled Finish

a. Primary Troweling: Where a troweled finish is specified, the surface must be finished first with power floats as specified above where applicable, then with power trowels. The first troweling after power floating must be done by a power trowel and must produce a smooth surface which is relatively free of defects, but which may still contain some trowel marks,
Trowel finish surfaces scheduled to receive the following: Where no other finish is specified.
b. Finish Troweling:
Additional troweling must be done after the surfaces have hardened sufficiently. The final troweling must be done when a ringing sound is produced as the trowel is moved over the surface. The final surface must be a smooth dense finish, free of any trowel marks and must be uniform in texture and appearance. On surfaces intended to support resilient tile, any defects of sufficient magnitude to show through the resilient tile must be removed by grinding. The floor must achieve an FF25/FL20 tolerance (FL17 for elevated slabs).

3. Broomed Finish:
   a. The surface must be given a coarse transverse scored texture, by drawing a broom or burlap belt across the surface. The operation must follow immediately after floating. Texture must be as approved by Commissioner from sample panels.
   b. Broom finish the following:
      1) Exterior Walkways
      2) Exterior Ramp

4. Non-Slip Finish:
   a. Areas other than pan-type stairs and platforms required to be non-slip must have abrasive aggregate sprinkled at the rate of 1/4 lb. for each square foot of surface. The surface must be given a smooth even trowel finish. Texture must be as directed by the Commissioner from sample panels.

5. Unfinished Slab Finish:
   a. Tamp the concrete using special tools to force the aggregate away from the surface, then screed with straightedges to produce a true and uniform surface as specified herein. Floor Flatness/Levelness Tolerances:

D. Location of Finishes:

1. Location of Finishes to be as noted on the architectural drawings.

E. Floor Flatness/Levelness Tolerances:

1. All floor flatness and levelness tolerances must conform to the requirements set forth in ACI 117 with commentary.

2. FF defines the maximum floor curvature allowed over 24 in. computed on the basis of the successive 12 in. (300mm) elevation differentials. FF is commonly referred to as the "Flatness F-Number".
   a. FF = 4.57
   b. Maximum difference in elevation, in decimals of inches, between successive 12" elevation differences.

3. FL defines the relative conformity of the floor surface to a horizontal plane as measured over a 10 ft. (3.05m) distance. FL is commonly referred to as the "Levelness F-Number".
   a. FL = 12.5
   b. Maximum difference in elevation, in decimals of inches, between two points separated by 10 ft.

4. All floors must be measured in accordance with ASTM E-1155 "Standard Test Method for Determining Floor Flatness and Levelness Using the "F Number" System (Inch-Pound Units). All slabs must achieve an overall tolerance as specified.

3.4 LIQUID DENSIFIER / SEALER

A. Apply liquid densifier/sealer on all exposed interior floors and floor slabs. Compound must be mechanically scrubbed into the surface in strict accordance with the directions of the manufacturer and just prior to completion of construction.

3.5 COORDINATION & CORRECTIVE MEASURES

A. Conflicts: The contractor is solely responsible for errors of detailing, fabrication, and placement of reinforcement steel; placement of inserts and other embedded items; and the structural adequacy of all formwork.

3.6 REPAIR OF DEFECTIVE AREAS

A. With prior approval of the Commissioner, as to method and procedure, all repairs of defective areas must conform to ACI 301, section 5.3.7, except that the specified bonding compound must be used.

B. The specified patching mortar may be used in lieu of the above-mentioned methods when color match of the adjacent concrete is not required. Prior approval by the Commissioner is required.

C. All structural repairs must be made with prior approval of the Commissioner, as to method and procedure, using the specified epoxy adhesive and/or epoxy mortar. Where epoxy injection procedures must be used, an approved low viscosity epoxy made by the manufacturers previously specified must be used.

D. Leveling of floors for subsequent finishes must be achieved by use of the specified underlayment material.

E. All exposed floors must be leveled, where required, with the specified self-leveling repair topping.

F. Repair methods not specified above may be used, subject to acceptance of the Commissioner.

END OF SECTION 03 30 00

SECTION 03 35 43 - POLISHED CONCRETE FINISHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract."

1.2 SUMMARY

A. Section Includes:

1. Polished concrete finishing, including exposed aggregate finishes.

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for concrete materials, mixture design, placement procedures, initial finishing, curing and concrete not designated as polished concrete.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with polished concrete to attend, including the following:

   a. Contractor's superintendent.
   b. Independent testing agency responsible for concrete design mixtures.
   c. Ready-mix concrete manufacturer.
   d. Cast-in-place concrete subcontractor.
   e. Polished concrete finishing Subcontractor.

2. Review curing procedures, construction joints, concrete finishing, and protection of polished concrete.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 "Submittal Procedures."

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Laboratory Test Reports: For liquid floor treatments, indicating compliance with requirements for low-emitting materials.

C. Polishing Schedule: Submit plan showing polished concrete surfaces and schedule of polishing operations for each area of polished concrete before start of polishing operations. Include locations of all joints, including construction joints.

D. Samples for Initial Selection: For each type of product requiring color selection.

E. Samples for Verification: For each type of exposed color.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Material Certificates: For each of the following, signed by manufacturers:

1. Repair materials.
2. Liquid floor treatments.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 "Quality Requirements."

B. Mockups: Before casting concrete, build mockups to verify selections made under Sample submittals and to demonstrate typical joints, surface finish, tolerances, and standard of workmanship. Build mockups to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Commissioner.
2. Demonstrate curing, finishing, and protecting of polished concrete.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

C. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by the manufacturer.

PART 2 - PRODUCTS

2.1 LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatments for Polished Concrete Finish: Clear, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; that penetrates, hardens, and is suitable for polished concrete surfaces.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. ARDEX Americas.
    b. Euclid Chemical Company (The); an RPM company.
    c. MAPEI Corporation.
    d. Or approved equal.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 POLISHING

A. Polish: Level 2: Low sheen, 400 grit unless otherwise indicated on drawings Interior Finish Legend or selected by the Commissioner.

B. Apply polished concrete finish system to cured and prepared slabs to match accepted mockup.

1. Machine grind floor surfaces to receive polished finishes level and smooth.
2. Continue polishing with progressively finer-grit diamond polishing pads to gloss level, to match approved mockup.
3. Control and dispose of waste products produced by grinding and polishing operations.
4. Neutralize and clean polished floor surfaces.

END OF SECTION 03 30 33

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 03 54 16 - HYDRAULIC CEMENT UNDERLAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Polymer-modified, self-leveling, hydraulic cement underlayment for application below interior floor coverings.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Product Data: For coatings, indicating VOC content.
2. Laboratory Test Reports: For coatings, indicating compliance with requirements for low-emitting materials.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

1.6 FIELD CONDITIONS

A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ventilation, ambient temperature and humidity, and other conditions affecting underlayment performance.

1. Place hydraulic cement underlayment only when ambient temperature and temperature of substrates are between 50 and 80 deg F.

PART 2 - PRODUCTS

2.1 HYDRAULIC CEMENT UNDERLAYMENTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. ARDEX Americas.
2. MAPEI Corporation.
3. USG Corporation.
4. Or approved equal.

B. Hydraulic Cement Underlayment: Polymer-modified, self-leveling, hydraulic cement product that can be applied in minimum uniform thickness of 1/4 inch and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C150/C150M, portland cement, or hydraulic or blended hydraulic cement as defined by ASTM C219.
2. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C109/C109M.
3. Underlayment Additive: Resilient-emulsion product of underlayment manufacturer, formulated for use with underlayment when applied to substrate and conditions indicated.

C. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch; or coarse sand as recommended by underlayment manufacturer.

1. Provide aggregate when recommended in writing by underlayment manufacturer for underlayment thickness required.

D. Water: Potable and at a temperature of not more than 70 deg F.

E. Reinforcement: For underlayment applied to wood substrates, provide galvanized metal lath or other corrosion-resistant reinforcement recommended in writing by underlayment manufacturer.

F. Primer: Product of underlayment manufacturer recommended in writing for substrate, conditions, and application indicated.

1. VOC Content: Provide coating with VOC content of 100 g/L or less.
2. Low-Emitting Materials: Coating must comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

G. Surface Sealer: Designed to reduce porosity as recommended by manufacturer for type of floor covering to be applied to underlayment.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. General: Prepare and clean substrate according to manufacturer's written instructions.

1. Treat nonmoving substrate cracks according to manufacturer's written instructions to prevent cracks from telegraphing (reflecting) through underlayment.
2. Fill substrate voids to prevent underlayment from leaking.

B. Concrete Substrates: Mechanically remove, according to manufacturer's written instructions, laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants that might impair underlayment bond.

C. Nonporous Substrates: For ceramic tile, quarry tile, and terrazzo substrates, remove waxes, sealants, and other contaminants that might impair underlayment bond, and prepare surfaces according to manufacturer's written instructions.

D. Adhesion Tests: After substrate preparation, test substrate for adhesion with underlayment according to manufacturer's written instructions.

3.3 APPLICATION

A. General: Mix and apply underlayment components according to manufacturer's written instructions.

1. Close areas to traffic during underlayment application and for time period after application recommended in writing by manufacturer.
2. Coordinate application of components to provide optimum adhesion to substrate and between coats.
3. At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.

B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.

C. Apply underlayment to produce uniform, level surface.

1. Apply a final layer without aggregate to product surface.
2. Feather edges to match adjacent floor elevations.

D. Cure underlayment according to manufacturer's written instructions. Prevent contamination during application and curing processes.

E. Do not install floor coverings over underlayment until after time period recommended in writing by underlayment manufacturer.

F. Apply surface sealer at rate recommended by manufacturer.

G. Remove and replace underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.

END OF SECTION 03 54 16

SECTION 04 20 00 – UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Removing and/or installing brick and/or hollow clay masonry units and providing and installing new brick and/or hollow clay masonry units to match, as indicated on drawings or as scheduled. Brick and/or hollow clay units and adjacent units that are damaged by the Contractor during removal are to be replaced with new elements to match at no cost to the City of New York.
2. Restoration of existing back-up, as required by the installation of new face materials including brick and hollow clay masonry, as required
3. Masonry repointing and cleaning
4. Furnish and install wall anchors and other accessories.
5. Coordination with supply and installation of flashing.
6. Coordination with masonry replacement.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 SUBMITTALS

A. Submit manufacturer's specification and other product data for each manufactured product including instructions for storage, handling and use.

B. Sustainable Design Submittals:

1. Environmental Product Declaration (EPD): For each product unless otherwise indicated.
2. Type III Environmental Product Declaration (EPD): For each product unless otherwise indicated.

C. Manufacturer's literature for the following products must be submitted by the Contractor. No work is to proceed until submittal has been approved:

1. Brick replacement.
2. Brick back-up.
3. Masonry anchors, ties, and other means of attachment

4. Hollow clay masonry replacement.

D. Provide the following data:
1. Composite Patching: composite patching, submit:

a. Composition of patch.
b. Manufacturer's literature describing materials for composite patching with results of laboratory tests on materials' general properties including compressive strength, freeze thaw resistance, and weather resistance.

E. Samples:

1. Submit brick and/or hollow clay masonry samples showing extreme variations in color and texture of surface finish. Samples selected and approved by the Commissioner are to be the standard. All material will conform to the approved samples.
2. Submit two full size back-up masonry units.

F. Test Reports: Submit the following test results:

1. Brick: Provide certified test reports showing that replacement brick conforms to the specified requirements.
2. Mortar: Provide certified test report that mortar complies with the requirements of BIA Technical Note 8A-1972.
3. Hollow Clay Masonry: Provide certified test report showing compliance with ASTM 67. For load bearing walls ASTM C-34 and Non Load Bearing ASTM C-56.

G. Shop Drawings: Submit shop drawings showing all sizes and profiles for each type of brick or masonry, or stone replacement unit. Shop drawings will indicate details of construction and jointing, supports, anchoring, sections, dimensions, and connection with other work. Submit elevations keying locations of replacement units.

1. Submit shop drawings showing attachment details for each replacement unit.
2. Separate details will be required for dissimilar substrate conditions at each replacement unit.
3. The Contractor will be responsible for all field measurements.

H. Submit the following data which has been signed and stamped by a qualified professional engineer licensed in the State of New York who thereby certifies preparing or supervising the preparation of the data to comply with requirements and recognized engineering principles and practice:

1. Engineering analysis of anchoring methods evidencing their compliance with performance requirements.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Restoration Specialist: The work should be performed by a Contractor who must, within the last 3 consecutive years prior to this project, have successfully completed in a timely fashion projects similar in scope and type to the required work, of comparable facilities.

C. Fabrication: Do not proceed with fabrication of products prior to completed review and approval of submittals and mock-ups.

D. Manufacturers: Obtain materials from manufacturers who will send a qualified technical representative to the project site for the purpose of advising the installer of the procedures and precautions for the use of their materials.
   1. Source: For each type of material required for the work of this Section, provide products from one manufacturer.

E. The Contractor will inspect and examine previous work done by other trades prior to starting any work. Alert the Commissioner of any conditions which may affect the work adversely. Failure to make such a report will mean that the Contractor finds the Work acceptable.

F. Coordinate work with other trades, including roofing and drainage subcontractors.

1.6 ENVIRONMENTAL AND PROJECT REQUIREMENTS

A. Strictly adhere to manufacturer's directions unless more stringent requirements are contained herein.

B. Temperature: Perform exterior work only when ambient temperatures and surface temperature of existing masonry and new materials are between 40 degrees F. and 80 degrees F. The restoration work may only be performed as long as the temperature remains above 40 degrees F. If in a given 24 hour period the temperature drops or is expected to drop below 40 degrees F., stop the exterior masonry work. If the temperature falls below 40 degrees F. at any time, work will not recommence until a constant temperature of 40 degrees F. or greater is projected for a minimum period of 72 hours. Once work is stopped due to temperature, continue work only with the written approval of the Commissioner.

   1. Weather and temperature conditions will also be within the limits established by the material manufacturers.

C. Hot Weather Protection: Use mortar within 1-1/2 hours after mixing. Discard all mortar over 1-1/2 hours old and all mortar that has stiffened due to hydration (setting).

D. Cold Weather Protection: Strictly comply with recommendations of Brick Institute of America Technical Note No. 1A, Cold Weather Masonry Construction, Construction and Protection Recommendations and the Portland Cement Association.

E. Take extreme care in protecting the building, surrounding materials, adjacent buildings, vehicles, and pedestrians. Ensure that protective measures are in place and are adequate for the work being performed. Repair or replace any items damaged in the course of the work at no extra cost to the City of New York and to the approval of the Commissioner.

F. Promptly as work proceeds and upon completion, remove excess mortar, smears and droppings. Clean adjacent and adjoining surfaces of marks arising out of the work. Protect sills, ledges, and projections from mortar droppings.

G. During the period of brick restoration work, protect all exposed areas from penetration by the elements at the end of every day's work.

1.7 TESTS

A. New brick will meet all criteria as set forth by ASTM C-67, Standard Methods of Sampling and Testing Brick and Structural Clay Tile.

B. Statement of Application: Submit letter from manufacturer verifying that new brick units are suitable for intended use.

C. Testing of Existing Mortar: Test the existing mortar of existing brick walls. Determine the composition, strength, proportions and all other characteristics of the mortar so that new mortar can match existing.

1.8 FIELD CONSTRUCTED MOCK-UPS

A. Provide the following field constructed mock-ups at the site in a location selected by the Commissioner:
   1. Replacement brick.
   2. Brick repointing.
   3. Cracked brick restoration.

B. These samples will demonstrate:
   1. For Brick: Methods and materials for replacement of deteriorated brick with new brick showing range of color and types of units.

C. Approved mock-ups and methods of procedure will become the standard of work of this Section.

D. Do not proceed with general demolition and replacement until related submittals and mock-ups are approved by the Commissioner.

1.9 DELIVERY, STORAGE, AND HANDLING

A. All replacement masonry materials will be carefully loaded and packed for transportation exercising customary and reasonable precaution against damage in transit. All brick will be property protected against damage in transit and at the building.
   1. The replacement masonry materials will be delivered in a clean and good condition, in quantity and in sequence as required to properly expedite the installation.
   2. Inspect replacement masonry materials immediately upon delivery to site. Reject masonry units damaged in transit, or failing to meet specifications and samples. Notify supplier in writing.

B. Carefully store and protect all replacement masonry materials from damage. Store material off the ground in a clean, dry location.
   1. Material exposed to weather before setting will be properly protected and covered to prevent wetting and resultant staining from wrappings or other materials.
   2. Remove materials which are damaged or otherwise unsuitable for use from the job site.

C. Installation of cracked, chipped or stained units will not be permitted.

D. All materials will be delivered to the job site in factory sealed containers clearly labeled with product name, manufacturer, color and other pertinent characteristics.

E. Store all materials used in this work in accordance with the requirements of the manufacturer.

1.10 SEQUENCING AND SCHEDULING

A. Furnish brick manufacturer with schedule of pieces to be manufactured and an installation sequence so that brick may be produced in the variety and quantity needed to match the installation sequence.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Face Brick: Conform with the following requirements:

   1. ASTM C216, Grade SW, Type FBX for brick body; size of units to match existing.
   2. Provide special shapes as indicated on drawings and as required to complete the work.
   3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. The Belden Brick Co.
      b. Endicott Clay Products Co.
      c. Glen-Gery Corp.
      d. Or approved equal.

B. Brick:

   1. Match existing size; conforming to requirements of ASTM C62, Grade SW, solid brick units.

C. Hollow Clay Masonry: Conform with the following requirements:
   1. Provide special shapes as indicated on drawings and as required to complete the work.
   2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

      a. Shreeram Tile Works
      b. Endicott Clay Products Co.
      c. Sundkahl Clay Work. Inc.
      d. Or approved equal

2.2 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I, free from water soluble salts and alkalis. Only one brand and product of one plant will be used for each mortar type.

B. Hydrated Lime: ASTM C207, Type S, not air-entrained.

C. Aggregate for Mortar: ASTM C 144, except for joints less than 1/4 inch use aggregate graded with 100% passing a No. 18 sieve. Where mortar is exposed and is indicated to match existing, provide mortar of special grade and color required to produce mortar matching color and texture of original mortar (with minimum addition of pigments) to the Commissioner's satisfaction.

D. Aggregate for Grout: ASTM C404, Compressive strength of grout for use with unit masonry will be at least equal to f'm = 2,500 pounds per square inch determined in accordance with ASTM C1019.

E. Water: Clean, potable water free from acids, alkalis, oils, salts, organic matter and other deleterious substances.

F. All pigments will be inorganic oxides (natural or synthetic), light fast, alkali resistant and non-fading.

2.3 MORTAR AND GROUT MIXES

A. Mortar: Provide mortar complying with ASTM C270 by proportion only. When mixing, use known, precise volume measures, do not batch by shovel. Dry ingredients will be well blended before the addition of water. No pigments are required. Mix consistently and uniformly.
   1. Provide Type N mortar for replication of brick mortar:

      a. Brick Mortar Composition:
         1) 1 part Cement:
         2) 7/8 part White Portland cement.
         3) 1/8 part Grey Portland cement.
         4) 1 part Hydrated Lime, Type S.
         5) 6 parts Aggregate:
         6) 4 parts New Jersey Pulverizing "100."
         7) 2 parts "Quikrete" White Sand.

B. Grout: Provide grout complying with ASTM C476 and with consistency appropriate to conditions.

C. Limitations: Use of admixtures or anti-freeze agents, masonry cement, calcium chloride or any compounds or mortar ingredients containing chlorides will not be permitted.

2.4 REINFORCEMENT, TIES AND ANCHORS

A. Wire ties: 1/4 inch diameter stainless steel wire, ANSI Grade 304.

B. Clips and Straps: 1/4 inch by 1-1/2 inch stainless steel AISI Grade 304.

C. Anchor rod: 3/8 inch and 3/4 inch diameter stainless steel rods, ANSI Grade 304.

D. Hangers: 5/8 inch and 1/2 inch diameter stainless steel rods, ANSI Grade 304.

E. Pins and Dowels: 1/2 inch stainless steel rods, ANSI Grade 304.

F. All other ties, nuts, bolts and anchors will be stainless steel AISI Grade 304.

G. Rolled steel shapes and plates: Comply with ASTM A-276, Grade 3l6 stainless steel

H. Welding electrodes for ASTM A-276 stainless steel, Grade 316 will conform to AWS A5.4 for shielded metal arc welding, electrode class E316, or to AWS A5.9 for gas metal arc welding, electrode class ER316 (ft=70 ksi). All welding will be done in the shop.

I. Ties, clips, anchor rods, hangers, pins, dowels, channels and attachments are to be by Hohmann & Barnard, Inc., or an approved equal manufacturer, unless otherwise indicated.

J. Anchoring Devices: Stainless steel as indicated on the Drawings.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Hilti Corporation
   b. Hohmann & Barnard.
   c. Cintec America Inc
   d. Or approved equal.

K. Brick Ties: Corrugated stainless steel 2 inch by 16 ga. grade 304, anchored to existing masonry with 3/8 inch diameter epoxy anchor.

2.5 CLEANING MATERIALS

A. Water: Potable.

B. Hot Water: Water heated to a temperature of 140 to 160 deg F.

C. Job-Mixed Mold, Mildew, and Algae Remover: Solution prepared by mixing 2 cups of tetrasodium polyphosphate, 5 quarts of 5 percent sodium hypochlorite (bleach), and 15 quarts of hot water for every 5 gal. of solution required.

2.6 ACCESSORIES

A. Bond Breaker Strips: Asphalt-saturated organic roofing felt complying with ASTM D226, Type I.

B. Weepholes: Plastic tubing, Medium density polyethylene, 3/8 inch outside diameter by 4 inches long.

C. Liquid Strippable Masking Agent: Manufacturer's standard liquid, film-forming, strippable masking material for protecting glass, metal, and polished stone surfaces from damaging effects of acidic and alkaline masonry cleaners.

1. Product: Subject to compliance with requirements, provide one of the following:
   a. ABR Products, Inc.; Rubber Mask.
   b. Price Research, Ltd.; Price Mask.
   c. PROSOCO; Sure Klean Strippable Masking.
   d. Or approved equal.

D. Masking Tape: Nonstaining, nonabsorbent material, compatible with pointing mortar, joint primers, sealants, and surfaces adjacent to joints; that will easily come off entirely, including adhesive.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSPECTION

A. Examine all substrates, supports, and conditions under which this work is to be performed and notify the Commissioner, in writing, of conditions detrimental to the proper completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected.

B. Each piece of new masonry will be examined for visible defects or damage. No cracked, warped or physically damaged pieces will be installed.

3.3 PREPARATION

A. Strictly comply with industry standards and manufacturer's instructions and recommendations, except where more restrictive requirements are specified in this Section. Beginning work means installer accepts substrates and conditions.

3.4 INSTALLATION: GENERAL

A. All brick will be set by competent, experienced masons accurately, made level and plumb and true to line. Unless otherwise noted every unit will be set in a full bed of mortar. Completely fill all head, bed, and collar joints with mortar. Mechanics will exercise care to see that all voids and joints are completely filled and made watertight.

B. Wetting Clay Brick: Wet brick made from clay or shale which will have ASTM C67 initial rates of absorption of more than 30 grams per 30 square inch per minute. Use wetting methods which ensure each clay masonry unit being nearly saturated and surface dry when laid.

C. Brick units will be accurately set, true to line and level. Where brick is installed adjacent to existing units, match existing adjacent construction for plumb and level.

D. All units will be clean before being set. Dirty units will be scrubbed with non-ionic water, using fiber bristle brushes, and then thoroughly rinsed with clean water.

E. Strictly comply with industry standards and recommendations of Brick Institute of America.

F. Walls are to be constructed to match original coursing, pattern, thickness, bonding, and keying, unless otherwise indicated.

G. Existing header bricks will be cut using motor-driven saws; they are not to be broken off by hand. All damage to interior back-up masonry caused by the Contractor must be replaced before the new exterior wythe of masonry is put in place.

H. Reinforcing: Install reinforcing as specified, required, and or indicated on drawings.

I. Joints and Bond: Lay face brick to create an interlocked wall to match existing construction.

1. Brick will be plumb, true to line, with level courses, accurately spaced, and joints aligned vertically. Drifting of joints will be cause for rejection of work.
2. Match existing coursing, bond, and decorative detailing unless indicated otherwise.
3. Lay brick in full beds of mortar. All joints in brick walls and joints between brick and other materials will be filled with mortar as each course in laid.
4. Jointing of rebuilt masonry will match existing masonry. Each course will key into and be flush with existing work. Bonding will exactly match existing bond pattern.
5. Joints will be uniform and will match existing work

J. Tooling: After mortar becomes thumb print hard, tool joints to match existing conditions as shown on Drawings, as work proceeds. Compress mortar to form a dense, smooth weather tight surface. Rake out mortar where sealants are to be installed.

3.5 CONSTRUCTION TOLERANCES

A. Variation From Plumb: For vertical lines and surfaces of columns, walls and arrises do not exceed 1/8 inch in 10 feet, or 1/4 inch in 20 feet, or 3/8 inch in 40 feet or more.

B. Variation From Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/8 inch in any bay nor 20 feet maximum, do not exceed 3/8 inch in 40 feet or more.

C. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8 inch with a minimum thickness limited to ½ inch. Do not exceed head joints thickness indicated by more than plus or minus 1/8 inch.

3.6 BRICK RECONSTRUCTION

A. Examine the areas and conditions where masonry restoration is to be executed and notify Commissioner of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until satisfactory conditions have been corrected by the Contractor and subject to the approval of the Commissioner.

B. Special effort will be made to coordinate the work of this section with steel restoration, brick removals and salvage operations.

C. All back-up masonry will be restored before rebuilding.

D. Lay out walls in advance for accurate spacing, uniform joint widths, and accurate bond pattern. Avoid the use of less than half size units.

E. Install work with random color variations with no groups of lighter or darker units.

F. Tooth new brick work into existing adjacent brickwork, unless indicated otherwise.

G. Lay masonry plumb and level with full bed and head joints fully buttered and shoved into place. Do not slush joints.

H. Remove, clean and reset with fresh mortar all masonry units that are disturbed after laying.

I. Weep Holes: Provide plastic weep tubes of the size specified at locations shown.

J. Cut brick units with power saw designed for cutting masonry with sharp, unchipped edges. Cut masonry to form special shapes as required. Where special shapes cannot be cut or formed without exposing coring or frogging, provide custom made special shaped units.

K. Lay out walls to match adjacent work, including matching of existing surface bond patterns with uniform joint widths. Accurately locate all openings, movement type joints, returns and offsets. Avoid using less than half size units at corners, jambs and wherever possible at other locations. Use of less than whole bricks must be approved by the Commissioner prior to installation.

L. Lay up walls and columns to comply with specified construction tolerances, with courses accurately spaced and coordinated with other work.

M. Lay masonry in running bond with vertical joint in each course centered on units in courses above and below. Bond and interlock each course of each wythe at comers. Do not use jambs.

N. Built-in Work: As the work progresses, build-in items specified under this and other sections of the specifications. Fill in solidly with masonry around built-in items.

1. Where built-in items are embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
2. Fill cores in hollow masonry units with grout 24 inches under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

O. When laying up new brick masonry to replace and other non-brick masonry units, make sure that the new brick joints line up with the existing, adjacent brick joints that are to remain.

3.7 REPOINTING MASONRY

A. Rake out and repoint joints to the following extent:

1. Joints where mortar is missing or where they contain holes.
2. Cracked joints where cracks can be penetrated at least 1/4 inch by a knife blade 0.027 inch thick.
3. Cracked joints where cracks are 1/16 inch or more in width and of any depth.
4. Joints where they sound hollow when tapped by metal object.
5. Joints where they are worn back 1/4 inch or more from surface.
6. Joints where they are deteriorated to point that mortar can be easily removed by hand, without tools.
7. Joints where they have been filled with substances other than mortar.
8. Joints indicated as sealant-filled joints.

B. Do not rake out and repoint joints where not required.

C. Rake out joints as follows, according to procedures demonstrated in approved mockup:

1. Remove mortar from joints to depth of joint width plus 1/8 inch, but not less than 1/2 inch or not less than that required to expose sound, unweathered mortar.
2. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
3. Do not spall edges of masonry units or widen joints. Replace or patch damaged masonry units as directed by Commissioner.
   a. Cut out mortar by hand with chisel and resilient mallet. Do not use power-operated grinders without Commissioner's written approval based on approved quality-control program.
   b. Cut out center of mortar bed joints using angle grinders with diamond-impregnated metal blades. Remove remaining mortar by hand with chisel and resilient mallet. Strictly adhere to approved quality-control program.

D. Notify Commissioner of unforeseen detrimental conditions including voids in mortar joints, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.

E. Where repointing work precedes cleaning of existing masonry, allow mortar to harden at least 30 days before beginning cleaning work.

3.8 STONE REPLACEMENT

A. Comply with instructions and recommendations of setting material manufacturers, except where more restrictive requirements are specified in this section.

B. Replace with new stone to match existing. Do not damage adjacent brick.

C. Setting Stone: Set new stone in full bed of mortar with vertical joints slushed full and with setting buttons to prevent extrusion of mortar and to control joint width. Align in precise alignment with existing brick. Coordinate installation of flashing.

D. Anchorage: Anchor stones to supporting construction with specified stone anchors, grouted and shimmed to maintain proper stone position and alignment.

3.9 FLASHING INSTALLATION AND COORDINATION

A. Flashings are specified in Section 07 62 00 "Sheet Metal Flashing and Trim". Coordinate the installation with masonry.

B. Prepare masonry surfaces to receive flashings smooth and free of projections. Prime surfaces to receive membrane flashing, ensuring that flashings are compatible with primer. Ensure that flashings are sealed and undamaged before covering with mortar.

3.10 CLEANING MASONRY

A. Proceed with cleaning in an orderly manner; work from top to bottom of each scaffold width and from one end of each elevation to the other. Ensure that dirty residues and rinse water will not wash over cleaned, dry surfaces.

B. Use only those cleaning methods indicated for each masonry material and location.

1. Do not use wire brushes or brushes that are not resistant to chemical cleaner being used. Do not use plastic-bristle brushes if natural-fiber brushes will resist chemical cleaner being used.
2. Use spray equipment that provides controlled application at volume and pressure indicated, measured at spray tip. Adjust pressure and volume to ensure that cleaning methods do not damage masonry.
   a. Equip units with pressure gages.
3. For chemical-cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with cone-shaped spray tip.
4. For water-spray application, use fan-shaped spray tip that disperses water at an angle of 25 to 50 degrees.
5. For high-pressure water-spray application, use fan-shaped spray tip that disperses water at an angle of at least 40 degrees.
6. For heated water-spray application, use equipment capable of maintaining temperature between 140 and 160 deg F at flow rates indicated.

C. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging masonry surfaces.

D. Water Application Methods:

1. Water-Spray Applications: Unless otherwise indicated, hold spray nozzle at least 6 inches from surface of masonry and apply water in horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.

E. Chemical-Cleaner Application Methods: Apply chemical cleaners to masonry surfaces to comply with chemical-cleaner manufacturer's written instructions; use brush or spray application. Do not allow chemicals to remain on surface for periods longer than those indicated or recommended by manufacturer.

F. Rinse off chemical residue and soil by working upward from bottom to top of each treated area at each stage or scaffold setting. Periodically during each rinse, test pH of rinse water running off of cleaned area to determine that chemical cleaner is completely removed.

1. Apply neutralizing agent and repeat rinse if necessary to produce tested pH of between 6.7 and 7.5.

G. After cleaning is complete, remove protection no longer required. Remove tape and adhesive marks.

3.11 CLEANING AND PROTECTION

A. At the end of each day or shut down period, it is imperative that all partially completed masonry work, including work at window and door sills and jambs and under unroofed areas, be shored as required and covered with a strong waterproof membrane held securely in place.

B. Thoroughly clean masonry of mortar particles and dirt. Clean with wooden paddles and stiff fiber bristle brushes using clean water. Cleaning will only occur after appropriate curing of the mortar, a minimum of seven (7) calendar days after work is completed.

C. Provide final protection and maintain conditions in a manner acceptable to Installer, which ensures masonry work being without damage and deterioration at time of completion.

END OF SECTION 04 20 00

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 05 12 00 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section includes: all labor, material, equipment, permits, and services necessary for the installation of structural steel and related work, complete, in accordance with the drawings and as specified herein including the detailing of all connections and the design of those connections not completely designed on the Contract Documents.

B. Related work specified in other sections:
   1. Section 05 31 00 "Steel Decking"
   2. Section 03 30 00 "Cast-In-Place Concrete"

1.3 APPLICABLE CODES AND STANDARDS

A. Code:
   1. Structural Steel work to conform to 2014 New York City Building Code and OSHA requirements.

B. Standards:
   1. American Institute of Steel Construction (AISC) "Specification for Structural Steel Buildings Load and Resistance Factor Design (LRFD), latest edition, including all supplements to date.
   2. AISC "Code of Standard Practice", latest edition, to be applied. Where a conflict exists between the Code of Standard Practice and the contract documents, the contract documents governs.
   3. American Welding Society (AWS) "Structural Welding Code", latest edition.
   4. AISC - "Specification for Structural Joints Using ASTM A325 or A490 Bolts", latest edition.
   5. American Society for Testing and Materials "ASTM Standards in Building Codes", latest edition.
   6. Steel Structures Painting Council "Steel Structures Painting Manual", latest edition.
   7. Occupational Safety and Health Act of 1970 (OSHA), as amended to date.
   8. AISC "specification for architecturally exposed structural steel."

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.5 ACTION SUBMITTALS

A. Product Data: Submit manufacturers' literature for standard items edited to suit job conditions.

B. Color Code: Submit color code proposed to identify various structural elements per the paragraph on Color Code in the Requirements Section, below.

C. Welding Procedures: Submit written welding procedures for all AWS Dl.l prequalified joints. Submit qualification procedures for all joints not prequalified by Section 2 of AWS Dl.l. For all weldments involving heavy members (ASTM A6 Groups 4 or 5 or plates 2" or thicker) or a high degree of restraint (junctions of several members, multiple stiffeners, etc.), submit written welding procedures showing welding positions, sequence of assembly, preheat, interpass and postheat requirements and any other information required to provide a satisfactory connection. This submittal will be submitted to the Testing Agency for approval before submitting to the Commissioner.

D. Mill Reports: Furnish three (3) certified copies of all mill reports covering the chemical and physical properties of all steel used in this project. Where required on the contract documents or by the AISC Code, reports will include results of Charpy V-notch tests. Prior to commencing the erection of steel, the contractor may deliver certificates to the City of New York in number and form as may be required by the New York City Building Department. Such certificates may be obtained from the mills producing the steel and may certify that the steel meets the minimum requirements as to physical properties, inspection, marking and tests for structural steel as defined by the Standard Specifications of the ASTM, A36, A572, A992, A500 current edition.

E. Quality Control Program: Submit complete details of the Contractor's quality control program.

F. Preconstruction Survey: Where interface with existing construction occurs, the existing construction is to be surveyed and such survey submitted before related shop drawings are prepared.

G. Shop and Erection Drawings (including Field Work drawings):
   1. The design of connections shown on shop and erection drawings must be prepared under the supervision of professional engineer licensed in the State of New York ("the Contractor's Engineer"). The contractor is responsible to design all connections not completely designed on contract documents, based on the loading information given in the contract documents and the paragraph on Requirements below. (A completely designed connection is only one that is indicated as such on the contract documents.)
   2. The shop and erection drawings must contain all dimensional and geometric information, grade of steel, shop surface treatments and shop connections. Materials will not be ordered, fabricated, or delivered to the site before the shop drawings have been approved by the Commissioner and returned to the Contractor.

H. Submittal of shop and erection drawings by the Contractor is to constitute Contractor's representation that the Contractor has verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar

data with respect thereto and reviewed or coordinated each drawing with other drawings and samples and with the requirements of the work and the Contract Documents.

1. Structural Steel Shop Drawings: Shop drawings must include layouts and details showing the type of steel for each member, sizes of members, connections, cuts, copes, holes, bolts and welds in structural steel-. Surface treatments (cleaning, shop paint, etc.) and provisions for the connection of other work will be indicated on the shop drawings.
2. Welds: All welds must be indicated by standard welding symbols in the "Standard Code for Arc and Gas Welding in Building Construction" or as accepted by the Commissioner. Shop and erection drawings will show the size, length, and type of each weld. Shop and erection drawings will indicate the type of electrodes to be used.
3. Job Standards: Submit job standards for all typical beam, girder, column splices, moment connections and wind bracing details prior to submitting detail drawings. Job standards will include calculations, when applicable, for details not specifically shown on the drawings. Job standards must be standardized to specific index sheets. The Contractor's Engineer must provide a letter certifying that the Job Standards have been prepared under their supervision.
4. Erection Drawings: Erection drawings to be redrawn to a minimum of 1/8" = 1'-0" scale. Reproduction of the contract documents will not be permitted. Materials must not be ordered, fabricated or delivered before the erection drawings have been reviewed by the Commissioner as appropriate and returned to the Contractor. The erection drawings must include plans showing exact locations of base and bearing plates, and/or bolts and other embedded items. All field connections, not specifically shown on shop drawings, must be shown on erection drawings. The size, type, and number of bolts must be indicated. The erection drawings must show the size, type, and length of all field welds.
5. Submittals: Shop and erection drawings must be submitted in complete packages so that individual parts and the assembled unit may be reviewed together. This Section and the applicable drawings used in the development of the shop and erection drawings must be referenced on each shop and erection drawing to facilitate checking. Index sheets must be furnished with all beam, girder and column details at the same time the details are submitted for review by the Commissioner.

I. As-Built Surveys: Upon completion of steel erection, submit the complete package of steel surveys to the Commissioner. Surveys must be performed by a licensed surveyor retained by the Contractor.

1.6 REQUIREMENTS

A. Delivery: All structural steel must be unloaded promptly upon arrival and must be stored in an area designated and approved by the Commissioner at the site of the work. The Contractor will be responsible for any demurrage charges due to failure to unload material promptly.

B. Storage: Structural steel must be kept drained properly. Adequate shoring and protection must be provided to prevent distortion and other damage. Structural steel must be stored on timber and not laid on mud, directly on ground or cinders, or

otherwise handled so as to damage finishes. All sections which are to be stored to be readily accessible for inspection.

C. Color Code: Use a color coding technique to aid in the shop and field identification of all different grades of steel. Each member used to bear its particular color code.

D. Design of Connections
1. "Specification for Structural Steel Buildings Allowable Stress Design and Plastic Design."
2. Design to be carried out by a licensed Professional Engineer in the State of New York in accordance with the paragraphs on Shop and Erection Drawings in the Submittals Section.
3. Use types of shop and field connections shown or, in absence of such indication, use the most appropriate type.
4. Design connections to safely withstand the combined effects of shears, axial forces, moments and torques.
5. Design and detail connections so as not to interfere with architectural clearance lines and finishes.
6. Design and detail connections to clear assigned spaces for duct and pipe runs, elevator shafts and ceiling construction.
7. Connections shown on the drawings that are not completely designed are illustrative only and show only minimum requirements. They must be completed by the Contractor's Engineer in accordance with the paragraphs on Shop and Erection Drawings in the Submittals Section.
8. Welded joints of heavy sections and plates (greater than 2 inches thick) must be detailed in a manner to limit the amount of weld metal. Double bevels must be used in lieu of single bevels where practicable. Joints must be detailed to allow for weld shrinkage (compressible spacers may be used on partial penetration and fillet welds). In cases of plates in more than one plane, welding operations must be sequenced on the drawings. In general, the welding must start at the most restrained part of the weldment and proceed to the least restrained (see paragraph on Welding Procedures in Submittals Section).
9. Comply with all connection notes on drawings in conjunction with the paragraphs on Shop and Erection Drawings in the Submittals Section.

E. Tolerances
1. Conform to the tolerances of the AISC "Code of Standard Practice".
2. Elevator shafts used for temporary hoists must conform to the detailed requirements of the hoist manufacturer.
3. Conform to the tolerances of the AISC "Code of Standard Practice", Section 10 (AESS) for architecturally exposed structural steel as indicated on the architectural drawings.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

1.8 QUALIFICATIONS

A. Welders: Before assigning any welders to work covered by this Section of the specification, the Contractor to provide the Commissioner with certifications that each welder has passed qualification tests and AWS procedures. Certifications to state that each welder has been doing satisfactory welding of the required type within the three-month period previous to the subject work. A certification to be submitted for each welding operator stating the name of the welder, the name and title of the person conducting the examination, the bend of specimens, the position of welds, the results of tests, and the date of examination.

1. If required by the Commissioner, the Contractor must submit identifying stenciled test coupons actually made by any welder whose workmanship is subject to question. The Contractor may require any welder to retake the test when, in the opinion of the Commissioner, the work of the welder created a reasonable doubt as to the proficiency of the welder. Tests, when required, must be conducted at the sole expense of the Contractor. Recertification of the welder must be made to the Commissioner only after the welder has taken and passed the required retest. Welder qualifications must be current per AWS specifications.
2. The Commissioner may require coupons to be cut from any location in any joint for testing. Should any two coupons cut from the work of any welder show strengths that do not meet AWS specifications it will be considered evidence of negligence or incompetence, and such welder will be permanently removed from working on any part of the structure. The members cut will be repaired at the sole expense of the Contractor in a neat and workmanlike manner with joints of proper type to develop the full strength of the members and joints cut, with penning or stress relief heat treatment as necessary. All sections of welds found defective will be chipped or cut out to base metal and rewelded properly before proceeding with the work.

1.9 QUALITY CONTROL

A. The Contractor must provide a system of quality control to ensure that the minimum standards specified herein are attained.

B. Submit to the Commissioner complete details of the quality control system to be used including the names of the personnel responsible for this work.

C. Bring to the attention of the Commissioner any defects in the work which are departures from the Contract Documents which may occur during construction. The Contractor must propose corrective action and recommendations in writing and submit them for review by the Commissioner.

D. The Commissioner’s general review during construction and inspection and testing by independent inspection and testing agencies are both undertaken to inform the Commissioner of performance by the Contractor but may in no way replace or augment the Contractor's quality control or relieve the Contractor of total responsibility for quality control.

PART 2 - PRODUCTS

2.1 STRUCTURAL STEEL

A. Structural steel must conform to ASTM A36, ASTM A572 Grade 50 or A992, and ASTM A500 as noted on the drawing.

2.2 GALVANIZING

A. The following steel members are to be hot dip galvanized:
   1. All angles and steel plates and shims supporting exterior masonry or exposed to the weather, including shelf, arch and relieving angles.
   2. All connections between the above angles, steel plates and the supporting structural member, including clip angles and hardware.
   3. Any other steel members indicated on the contract drawings.
   4. All miscellaneous metal, angles, clips, etc. on the exterior wall.

B. Cleaning and Surface Preparation:
   1. Hardware (bolts, nuts, etc.) must be clean and free of mill scale before galvanizing.
   2. Steel members must be cleaned in accordance with SSPC –SP3, Power Tool Cleaning, before galvanizing.

C. Shop coat:
   1. Hardware must be hot-dip galvanized in accordance with ASTM A153.
   2. Steel members must be hot-dip galvanized in accordance with ASTM A123. Zinc coating will be applied at 2.0 oz. per square foot.

D. Field Touch Up: After erection, all damaged areas to the galvanizing, welds and areas adjacent to welds must be cleaned and painted with the galvanizing repair paint to comply with ASTM A780.

2.3 ACCESSORIES

A. High Strength Bolts: High strength bolting must conform to the provisions of the Research Council on Riveted and Bolted Structural. Joints (RCRBSJ) "Specifications for Structural Joints using ASTM A325 or A490 Bolts", latest edition, except that nuts must be ASTM A194 Grade 2H or A563 Grades DH or DH3 (hardened) for both A325 and A490 bolts.

B. Direct Tension Indicators: Provide load indicating washers or approved equal devices for the direct tension indicators meeting ASTM F959 at all slip critical and direct tension connections as defined by the "Specification for Structural Joints using ASTM A325 or A490 bolts" where A325 bolts larger than 7/8 inch diameter or A490 bolts larger than 3/4 inch are used. This method of tension control is required at wind girders, bracing, cantilevers and trusses, and where specifically called out on the drawings.

C. Unfinished Bolts: Unfinished bolts must conform to ASTM A307 and must not be used at slip-critical, direct-tension or beam-to-column connections. Unfinished bolts must

have square heads and nuts and must differ in diameter from high-strength bolts by at least 1/8" to avoid confusion.

D. Anchor Bolts: Anchor bolts must be the heavy hexagon head type and must conform to ASTM F1554 Grade 55 unless otherwise specified on the contract drawings.

E. Washers: Round washers must conform to ASTM A-F436 or American Standard B 27.2 type b. Washers in contact with high-strength bolt heads and nuts must be hardened in accordance with ASTM Standard A325. Beveled washers may be square, smooth, and sloped so that contact surfaces of the bolt head and nut are parallel. The diameter of the hole of square beveled washers must be 1/16 inch greater than the bolt size for bolts smaller than one inch and must be 1/8 inch greater than the bolt size for bolts larger than one inch.

F. Welding Electrodes: Electrodes must be low hydrogen and must be selected from Table 4.1.1 of AWS Dl.l.
   1. Shielded Metal-Arc Welding: Welding electrodes for manual shielded metal-arc welding must conform to the specification for Mild Steel Covered Arc-Welding Electrodes, AWS A5.1 E70 or 80, or the specification for Low-Alloy Steel Covered Arc-Welding Electrode, AWS A5.5.
   2. Submerged-Arc Welding: Bare electrodes and granular flux used in submerged-arc welding must conform to F70 or F80 AWS flux classifications of the specification for Bare Mild Steel Electrodes and Fluxes for submerged-arc welding, AWS A5.17.
   3. Where Charpy V-notch values are required on the base metal, an electrode meeting the requirement of AWS and having a minimum average Charpy V-notch impact strength of 25 ft./lbs at minus 20- F. are to be selected.

G. Expansion Bolts: High performance expansion anchors

H. Shop Paint: For all steel members that are not scheduled to receive spray-on fireproofing, intumescent paint or concrete encasement, provide shop paint as indicated below:

   1. Interior steel members must receive one coat 90 at a dry film thickness of 2.0-3.5 mils.
      a. Products: Subject to compliance with requirements, provide one of the following:
         1) Tnemec Company 88-555 Azeron,
         2) Dupont 67-746,
         3) Devoe 20.
         4) PPG 6-201
         5) Or approved equal.

   2. Exterior (exposed to the elements) steel members such as dunnage members, support members and other items identified as “Exterior Exposed Painted Steel” (EEPS) must receive the following shop applied coating systems:
      a. Primer: Zinc rich primer in an inorganic resin.
      b. Products: Subject to compliance with requirements, provide one of the following:
         1) Carboline Co. “Carbo-Zinc 11 HS
         2) Carbo-Zinc 11 VOC”; 2.5 to 4.0 mils min. d.f.t.
         3) Tnemec Co. “Tnemec 90-93 Tneme –Zinc; 2.5 to 3.5 mils min. d.f.t.

4) Ameron Protective Coatings "Dimecote 21-9"; 3.0 mils min. d.f.t.
5) Or approved equal.

c. Intermediate Coat: Compatible with, and of the same manufacturer as, the primer. High build, high solids, epoxy mastic.
d. Products: Subject to compliance with requirements, provide one of the following:
1) Carboline Co.; "Carboline 893/898LT" 4.0 – 6.0 mils d.f.t.
2) Tnemec Co. Inc.; "Tnemec 69 Hi-Build Epoxoline II" 4.0 – 6.0 mils d.f.t.
3) Ameron Protective Coatings; "Amerlock 400" 5.0 – 8.0 mils d.f.t.
4) Or approved equal.

e. Finish Coat: Compatible with, and of the same manufacturers as, the primer and the intermediate coat. Hifh build, aliphatic polyurethane, satin finish.
f. Products: Subject to compliance with requirements, provide one of the following:
1) Carboline Co.; "Carboline 133 HB/833". 3.0 – 5.0 mils d.f.t.
2) Tnemec Co. Inc.; "Series 175 Endura-Shield III" 3.0 – 5.0 mils d.f.t.
3) Ameron Protective Coatings; "Amershield" 4.0 – 5.0 mils d.f.t.
4) Or approved equal.

g. Entire paint system must resist exposure to chemicals in cooling tower exhaust as well as other mechanical systems and local atmospheric conditions.

3. Interior steel members identified as "Architectural Exposed Structural Steel" (AESS) will receive the following shop applied primer and finish paint system. All prime coats of paint will be shop applied. Utilize contrasting colors between primer and finish coats. All surfaces of exposed steel will receive intermediate and finish coat of paint. Color of finish paint will be a custom color as selected by Commissioner.
a. Primer: Compatible with finish coats of paint; shop apply primer to the respective dry film mil thickness specified or as recommended by the manufacturer.
b. Products: Subject to compliance with requirements, provide one of the following:
1) Tnemec Co. Inc.; "FC27 Typoxy" 4.0 – 6.0 mils d.f.t.
2) Carboline Co.; "Carboline 890" 4.0 – 6.0 mils d.f.t.
3) Ameron Protective Coatings; "Amerlock 400" 4.0 – 6.0 mils d.f.t.
4) Or approved equal.

c. Finish Paint: Field apply finish paint to the respective dry film mil thickness specified or as recommended by the manufacturer.
d. Products: Subject to compliance with requirements, provide one of the following:
1) Tnemec Co. Inc.; "Series 175 Endura-Shield III" 3.0 – 5.0 mils d.f.t.
2) Carboline Co.; "No. 133HB Polyurethane" 3.0 – 5.0 mils d.f.t.
3) Ameron Protective Coatings; "Amershield" 4.0 – 5.0 mils d.f.t.
4) Or approved equal.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Work by Other Trades: Examine all work prepared by other trades to receive work of this Section and report any defects affecting installation to the Commissioner for correction. Commencement of work will be construed as complete acceptance of preparatory work by other trades. The Contractor alone must be responsible for checking the dimensions and coordination of the structural steel work with other trades.

B. Anchor Bolts: The Contractor must ascertain by accurate survey the existing location, alignment, and elevation of the anchor bolts embedded in the concrete by other trades at least 21 working days prior to the start of the structural steel erection. Immediately bring to the attention of the Commissioner any discrepancies observed between the contract documents and the as-built conditions. Steel erection will not start until corrective measures if required, have been performed.

3.3 ASSEMBLY

A. Workmanship: Workmanship must be equal to the best practice in the trade.

B. Holes: All holes must be accurately drilled or punched at right angles to the surface of the metal in accordance with AISC Specifications. Holes may not be made or enlarged by burning. Burning or drifting unfair holes will not be permitted. Holes that must be enlarged or be reamed. Drift pins will be allowed only to bring together the several parts for connection. Holes in base plates are to be drilled. Holes are to be clean-cut without torn or ragged edges. Outside burrs resulting from drilling operations are to be removed with a suitable tool. Holes are to be provided in members to permit connections to the work of other trades.

C. Cutting: The use of manual gas cutting in the shop may be used only if automatic or semi-automatic methods are not possible. If manual shop cutting is required, it must be done only with a mechanically guided torch, except that an unguided torch may be used where the cut is more than 1/2" from the finished dimension and final removal is completed by means such as chipping or grinding to produce a gouge free surface of quality equal to that of the base metal. At restrained joints and as indicated elsewhere, weld access holes must be ground smooth.

D. Connections: All connections must be bolted or welded. Slip critical connections are required at spandrel beams, wind girders, bracing, trusses, cantilevers, direct/tension connections. and where specifically called out elsewhere. (See paragraph on Installation of High Strength Bolts, below). All connections must be designed to conform to the requirements of the AISC standards previously cited. Where connections are indicated on the contract drawings, no deviation from the type and method thereof may be made without the approval of the Commissioner. One sided or other types of eccentric connections will not be permitted without the approval of the Commissioner. Standard connections are to be used wherever possible. Connections are to be designed to provide for the reaction indicated on the drawings. If no reaction is indicated on the plan, a connection must be provided for the reaction tabulated in the allowable loads on beam section in Part 2 of the AISC Manual of Steel Construction, ASD Ninth Edition.

E. Bolting:

1. Bolts must be driven accurately into the holes without damaging the threads. Bolt heads must be protected from damage during driving. Bolt heads and nuts must rest squarely against the metal. Where bolts are to be used on beveled surfaces having slopes greater than 1 in 20 with a plane normal to the bolt axis, beveled washers are to be provided to give full bearing under the head or nut. Bolt threads for unfinished bolts or any bolts, which are shown, as "snug tight" will be deformed to prevent the nuts from backing off.
2. Anchor bolts and base plates are to be labeled and shipped in sets indicating sizes and locations of columns. Delivery of anchor bolts are to be made in ample time prior to the start of related concrete work. Templates are to be furnished, together with instructions for setting of anchor bolts. Provide 3" x 3" x 5/16" min. plate washers between top of base plate and bottom of anchor bolt nuts.

F. Installation of High Strength Bolts:

1. Except where "snug tight" installation is specifically permitted on design drawings, all high strength bolts must be installed for full tension using load indicating washers for the direct tension indicators (DTI's), Turn-of-Nut tightening or calibrated wrench tightening in accordance with the “Specification for Structural Joints Using ASTM A325 or A490 Bolts”, as approved by the Research Council on Structural Connections, November 13, 1985, with Section 4, 5, and 6 replaced by their corresponding sections stated in LRFD format, dated September 1, 1986 and endorsed by the American Institute of Steel Construction. Direct tension indicators are to be used at the slip-critical connection locations set forth above in the Connections paragraph of this Section.
2. Special washer requirements of the Research Council Specification, such as those related to slotted and oversize holes, and tapered flanges, must be properly observed. The DTI "washers" may not be substituted for such required washers.
3. Calibrated wrenches, and alternate design bolts, must be checked daily at the job site using a Skidmore tester and bolts of same size, type and thread condition as those to be tightened that day.
4. A325 bolts over 7/8" diameter and A490 bolts over 3/4" diameter may have a dry lubricant on threads such as a stick wax lubricant before installation.
5. All bolts, which have dried out (lost as-shipped lubricant film) or rusted, may have threads cleaned and lubricated by dry lubricant before installation.

G. Welding of Structural Steel:

1. Pre-Weld Inspection: The surface to be welded and the filler material to be used must be subject to inspection before welding is performed.
2. Method and Type of welding indicated on the contract drawings or the approved shop or erection drawings must be electric arc welding and must comply in all respects with the codes and specifications herein noted covering the design, fabrication, and inspection of welded structures and the qualifications of welders and supervisors. The heat, input, length of weld, weld sequence and cooling process must be controlled to prevent distortions. For weldments whose configuration could restrain contraction during cooling of the weldment, extreme precautions should be taken. In such cases the sequence of welding operations must be shown on the shop drawings. When welding plates thicker than 11/2", take special precautions to control welding procedure and cooling process in order to minimize shrinkage stresses. Use stress-relieving techniques where

necessary. Each welder may mark their own identification symbol on their own work.

H. Openings in Beams:

1. Provide openings in beams where called for on the drawings.
2. Reinforce openings as per typical details.

I. Bearing:

1. Bearing ends of columns are to be milled perpendicular to axis of the column.
2. Mill bearing areas of base plates.
3. At small columns and posts, square saw cut ends and pressed base plates may be acceptable subject to Commissioner's approval.
4. Protect milled and sawn bearing surfaces with an approved rust-inhibiting coating, which is to be removed immediately prior to erection.

J. Stiffeners: Provide web stiffeners in all girders and beams at points of concentrated loads where required by the AISC Specification or specifically shown on the drawings. Fitted stiffeners must be ground to fit closely against flanges.

K. Cleaning and Preparation of Steel Surfaces:

1. All steel work must be cleaned in accordance with the Steel Structures Painting Council (SSPC) Method specified herein that corresponds to its location and exposure. Steel work to be painted must be painted within the same day that it is cleaned.
   a. Interior, Not Exposed to View (i.e., above suspended ceilings, under sprayed-on fireproofing): SSPC-SP-2 Hand Tool Cleaning.
   b. Interior, Exposed in the Finished Building: SSPC-SP-3 Power Tool Cleaning.
   c. Exterior (exposed to elements): SSPC-SP-6 Commercial Blast, Cleaning.
   d. Architecturally exposed steel to receive a 3 coat paint system: SSPC-SP-6 Commercial Blast Cleaning.

L. Shop Painting:

1. Paint scheduled steel areas in accordance with manufacturer's printed label directions.
2. Do not paint:
   a. Surfaces within two (2) inches of field welds.
   b. Surfaces to be encased in concrete or to receive fireproofing.
   c. Contact surfaces of high-strength bolted friction connections (unless paint has been specifically prequalified by the contractor or approved for use in this location by the Commissioner).
   d. Milled bearing surfaces.
3. Paint must be applied thoroughly and evenly to dry surfaces only when surface temperatures are above dew-point, in strict accordance with manufacturer's instructions.

4. Surfaces of exterior members which are inaccessible after assembly or erection will receive their second coat of the approved paint, in a different shade, in the shop.

3.4 ERECTION

A. Workmanship: All work must be erected plumb, square and true to lines and levels in strict accordance with the structural requirements of the building within tolerances of the AISC Code of Standard Practice.

B. Bracing: Securely brace the frame during erection to safely resist all dead, wind load and other erection loads. Fully tighten all bolts as soon as possible as the work progresses. Design temporary bracing or guying to limit lateral floor to floor displacements to 3/8" for the worst combination of loads stated above. Remove temporary bracing which is no longer required and interferes with other trades or finishes.

C. Errors: Immediately report to the Commissioner any errors in shop fabrication, deformations resulting from handling and transportation, and improper erection that affect the assembly and fitting of parts. Prepare details for corrective work and obtain approval of the method of correction. Approved corrections are to be made expeditiously at the sole expense of the Contractor.

D. Column Base Plates: Column base plates are to be supported and aligned on steel shims or setting bolts. After the supported members have been plumbed and properly positioned the anchor nuts must be tightened, in preparation for grouting. Wedges and shims must be cut off flush with edges of plates and must be left in place. The use of leveling plates will not be permitted. All base plates greater than 20 inches in any dimension must be set on steel angle seats or shim packs.

E. Grouting: Refer to Section 03300 Cast-in-Place Concrete. Base plates are to be grouted immediately after the first tier of columns are plumbed. Steel erection must not proceed above the first tier until base plates are grouted.

F. Bolting and Welding of Structural Steel:
   1. See Section on "Assembly".

G. Bearing Surface: Clean bearing surfaces and surfaces that will be in permanent contact before the members are assembled.

H. Splices: Fastening of splices of compression members are to be done after cleaning of the surfaces and the abutting surfaces have been brought completely into contact. Any remaining gaps are to be filled with steel shims driven into place and cut flush. Tack weld shims to each other and to members. Splices will be permitted only where indicated on the contract drawings or the reviewed shop drawings. Bevel weld splices must use runoff tabs, which will be cut off and ground smooth after weld completion.

I. Driftpins: Driftpins may be used only to bring together the several parts, and will not be used in such a manner as to distort or damage the metal. Poor matching of holes must be corrected by drilling to the next larger size and the use of larger size bolts. Plug

welding and redrilling will not be permitted, unless a specific instance arises and is approved by the Commissioner.

J. Hammering: Hammering which may injure or distort the members will not be permitted.

K. The use of cutting torches in the field will not be permitted without the specific approval of the Commissioner for each application. Where cutting torch use is permitted, all the requirements of the Section on "Assembly" must apply.

L. Additional Material and Labor: If the Contractor furnishes additional material and labor for the purpose of erection or if the erection method requires that material be added to certain members, the required modifications must be at the sole expense of the Contractor.

M. Alignment: Following erection, all members must be aligned, leveled, and adjusted accurately prior to final fastening. Tolerances must conform to the AISC Standards.

N. Touch-Up and Field Applied Paint: After erection, all damaged areas in the shop coat, exposed surfaces of bolts, bolt heads, nuts and washers and all field welds and unpainted areas adjacent to field welds will be cleaned to the same standards as the shop coat and painted with the same paint used for the shop coat. After touch up, exterior (exposed to the elements) steel members will receive a full coat of the specified paint in a different shade than the shop-applied coat.

O. Miscellaneous:

1. Provide steel brackets and seats for curtain wall and precast concrete panels as shown on the drawings and as may be required by details of the curtain wall. Modify brackets to suit the detail requirements of the curtain wall. Coordinate details and locations with curtain wall sub-contractor.

END OF SECTION 05 12 00

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 05 12 13 - ARCHITECTURALLY EXPOSED STRUCTURAL STEEL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Section includes: all labor, material, equipment, permits, and services necessary for the installation of structural steel and related work, complete, in accordance with the drawings and as specified herein including the detailing of all connections and the design of those connections not completely designed on the Contract Documents.

B. Related work specified in other sections:

1. Structural Steel Framing Section 05 12 00
2. Cast-In-Place Concrete Section 03 30 00

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
3. Review temporary protection requirements for AESS assembly during and after installation.
4. Review procedures for repair of finish damaged after installation.
5. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each element and fastener.

B. Sustainable Design Submittals:

1. Environmental Product Declaration: For each product.
2. Health Product Declaration: For each product.
3. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.

C. Shop Drawings:

1. Include fabrication and installation layouts of assembly components, and special details.
2. Detailing fabrication of AESS components.

a. Provide erection drawings clearly indicating which members are considered as AESS members.

b. Include details that clearly identify all of the requirements listed in Part 2 "AESS Fabrication and Part 3 "AESS Erection" of this specification. Provide connections for exposed AESS consistent with concepts shown on the architectural drawings.

c. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length and type of each weld. Identify grinding, finish and profile of welds as defined herein.

d. Indicate type, size, finish and length of bolts, distinguishing between shop and field bolts. Identify high-strength bolted slip-critical, direct-tensioned shear/bearing connections. Indicate to which direction bolt heads should be oriented.

e. Clearly indicate which surfaces or edges are exposed and what class of surface preparation is being used.

f. Indicate special tolerances and erection requirements as noted on the drawings or defined herein. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. AESS typical members 12 inches long by actual member size. Include fasteners.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Erector, engage an AISC Certified Erector, experienced in erecting AESS work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

B. Field quality-control reports.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For AESS finish in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver AESS to Project site in such quantities and at such times to ensure continuity of installation. All tie downs on loads must be nylon straps or use softeners when using chains or wire rope slings to avoid damage to edges and surfaces of members. The standard for acceptance of delivered and erected members must be equivalent to the standard employed at fabrication.

B. Unload, store, and Erect pre-painted finish pieces using padded slings or other methods such that they are not damaged. Provide padding as required to protect while rigging and aligning member's frames. Weld tabs for temporary bracing and safety cabling only at points concealed from view in the completed structure or where approved by the Commissioner during the pre-installation meeting. Methods of removing temporary erection devices and finishing the AESS members must be approved by the Commissioner prior to erection. Retain strippable protective covering on members during installation.

C. Conform to ANSI/AISC 303-16 Sections 10.4, 10.5, and 10.6.

PART 2 - PRODUCTS

2.1 PAINT SYSTEM

A. Compatibility: All components/procedures of the AESS paint system must conform to the coating system specified, submitted, and approved per Section 05 12 00 Structural Steel Framing. As a minimum identify required surface preparation, primer, and finish coat. Primer, and finish coating must be from a single manufacturer combined in a system documented by the manufacturer with adequate guidance for the fabricator to procure and execute.

B. Primer: Primer must comply with all federal standards for VOC, lead and chromate levels

C. Finish Coating: Spray applied in the Field.

2.2 FABRICATION AESS 3

A. Use special care in handling and shipping of AESS both before and after shop painting minimize damage to any shop finish. Use Nylon type slings or softeners when using chains or wire rope slings.

B. The permissible tolerances for member depth, width, out of square, and camber and sweep must be as specified in ASTM A6/A6M-2014 Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling (ASTM A6/A6M), ASTM A500/A500M-2013 Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes (ASTM A500/A500M), and Standard Specification for Cold-Formed Welded Carbon Steel Structural Sections (HSS) (ASTM A1085/A1085M).

C. Fabricate and assemble AESS in the shop to the greatest extent possible. Locate field joints in AESS assemblies at concealed locations or as approved by the Commissioner. Detail AESS assemblies to minimize field handling and expedite erection.

D. Remove blemishes or unsightly surfaces resulting from temporary braces or fixtures.

E. Remove all backing and run out tabs.

F. Grind all sharp edges smooth, including all sheared, punched or flame cut edges.

G. Provide a continuous appearance to all welded joints including tack welds. Provide joint filler at intermittent welds.

H. Bolted Connections: Make in accordance with Section 05 12 00. Provide bolt type and finish as noted herein.

I. Weld Connections: Comply with AWS D1.1 and Section 05 12 00. Appearance and quality of welds must be consistent. Assemble and weld built-up sections by methods that will maintain alignment of members without warp exceeding the tolerance of this section.

J. Install all bolts on the same side of the connection. Oriented uniformly in the direction indicated Consistent from one connection to another.

K. Remove all weld spatter, slivers and similar surface discontinuities.

L. Grind off projections larger than 1/16” at butt and plug welds.

M. Continuous Weld Appearance: Where continuous welding is noted on the drawings, provide welds of a uniform size and profile.

N. Seal Welds: Seal weld open ends of round and rectangular hollow structural section with 3/8" closure plates. Provide venting as required for galvanized members.

O. Fabricate to Requirements of 2.3 and as follows

P. The as-fabricated straightness tolerance must be one-half of that specified in ASTM A6/A6M, ASTM A500/A500M, or ASTM A1085/A1085M.

Q. For curved structural members, whether composed of a single standard structural shape or built-up, the as-fabricated variation from the theoretical curvature must be equal to or less than the standard camber and sweep tolerances permitted for straight members in the applicable ASTM standard.

R. The tolerance on overall profile dimensions of welded built-up members must one-half of that specified in AWS D1.1/D1.1M: 2015 Structural Welding Code – Steel (AWS D1.1).

S. Provide hidden part marks or piece marks that may be fully removed after erection.

T. Fabricate AESS with exposed surfaces smooth, square and of surface quality consistent with the approved mock up.

U. Grind projections at butt and plug welds to be smooth with the adjacent surface.

V. Orientation of HSS seams must be as shown.

W. Copes, miters, and cuts in surfaces exposed to view must have a maximum gap of 1/8” in an open joint. If the gap is shown to be in contact, the contact must be uniform within 1/16”.

X. Mill marks must not be exposed to view. If it is not possible to hide mill marks, then the mill marks are to be removed by appropriate length cutting of mill material. If this is not possible, the fabricator must remove the mill mark, grind, and fill the surface to be consistent with the approved mock up.

Y. The matching of abutting cross sections is required.

2.3 SHOP PRIMING

A. Provide surface preparations to SSPC-SP3. Coordinate the required surface profile with the approved paint submittal prior to beginning surface preparation. Remove any grease and oil using solvent cleaning to meet SSPC-SP 1. Weld spatter, slivers and similar surface discontinuities must be removed. Sharp corners resulting from shearing, flame cutting or grinding must be eased.

B. Priming: Immediately after surface preparation, apply primer according to manufacturer’s instructions to provide a dry film thickness of not less than 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
2. Apply two coats of shop primer to surfaces that are inaccessible after assembly or erection.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. The erector must check all AESS members upon delivery for twist, kinks, gouges or other imperfections which may result in rejection of the appearance of the member. Coordinate remedial action with fabricator prior to erecting steel.

3.3 PREPARATION

A. Provide connections for temporary shoring, bracing and supports only where noted on the approved Fabrication Documents. Temporary connections not shown must be made at locations not exposed to view in the final structure or as approved by the Commissioner. Handle, lift and align pieces using nylon straps or chains with softeners required to maintain the appearance of the AESS through the process of erection.

3.4 ERECTION

A. Employ special care to handle and erect AESS. Erect finish pieces using nylon straps or chains with softeners such that they are not damaged.

B. Place weld tabs for temporary bracing and safety cabling at points concealed from view in the completed structure or where approved by the Commissioner during the pre-installation meeting. Methods of removing temporary erection devices and finishing the AESS members must be approved by the Commissioner prior to erection.

C. AESS Erection tolerances: Erection tolerances must meet the requirements of standard frame tolerances for structural steel per Chapter 7 of ANSI/AISC 303-16.

D. Set AESS accurately in locations and to elevations indicated and according to AISC specifications referenced in this Section.

E. Remove blemishes or unsightly surfaces resulting from temporary braces or fixtures

F. Remove all backing and run out tabs.

G. When temporary braces or fixtures are required to facilitate erection, care must be taken to avoid any blemishes, holes or unsightly surfaces resulting from the use or removal of such temporary elements.

H. Bolted Connections: Align bolt heads on the same side of the connection as indicated on the approved fabrication or erection documents.

I. Weld Connections: Comply with AWS D1.1 and Section 05 12 00. Appearance and quality of welds must be consistent. Employ methods that will maintain alignment of members without warp exceeding the tolerance of this section.

J. Remove all weld spatter exposed to view.

K. Grind off projections larger than 1/16” at field butt and plug welds.

L. Continuous Welds: Where continuous welding is noted on the drawings, provide continuous welds of a uniform size and profile.

M. Do not enlarge holes in members by burning or by using drift pins. Ream holes that must be enlarged to admit bolts. Replace connection plates that are misaligned where holes cannot be aligned with acceptable final appearance.

N. Splice members only where indicated.

O. Obtain permission for any torch cutting or field fabrication from the Commissioner. Finish sections thermally cut during erection to a surface appearance consistent with the mock up.

P. Provide a continuous appearance to all welded joints including tack welds. Provide joint filler at intermittent welds.

1. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.5 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal plate wall panel units within installed tolerance of 1/4 inch in 20 feet, non-accumulative, on level, plumb, and location lines as indicated, and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.6 CLEANING AND PROTECTION

A. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint must be completed to blend with the adjacent surfaces of AESS. Such touch up work must be done in accordance with manufacturer's instructions and as specified in Division 9, Section “09 91 00 Painting.”

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded area. Any repairs to galvanized surfaces must comply with ASTM A780/A780M – 2015 Standard Practice for Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings.

END OF SECTION 05 12 13

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 05 31 00 – STEEL DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. All labor, material, equipment, permits, and services necessary for the installation of structural steel and related work, complete, in accordance with the drawings and as specified herein.
2. Composite construction type floor decking complete with special width closure units, flashings, metal closures, concrete stops, accessories and fittings as required for a complete installation.

B. Related Sections:

1. Section 05 12 00 "Structural Steel Framing"
2. Section 03 30 00 "Cast-In-Place Concrete"

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 "Submittal Procedures."

1.4 SUBMITTALS

A. Shop Drawings must clearly indicate the type of decking, hardware, framing reinforcement anchorage sump pans, cant strips, ridge and valley plates closure plates, finish, gauges of metal, where located, arrangement of sheets, welding pattern, side and end details of metal deck, necessary fabrication to incorporate decking into the job, and correlation with other requirements openings and flashings. The shop drawings must contain all dimensional and geometric information. Materials may not be ordered, fabricated, or delivered to the site before the shop drawings have been reviewed and returned to the Contractor.

1. Shop drawings must also include the registration number seal, signature and address of the Professional Engineer registered in the State of New York who prepared or supervised the preparation of the shopdrawings.If, after welding, visual inspection reveals shear connectors that do not show full fusion in the weld zone, or a full 360 degree weld fillet, such shear connectors must be struck sharply with a hammer until they are bent

approximately 15 degree off the vertical without weld failure. Shear connectors failing this test must be replaced at no additional cost to the City of New York.

2. Prior to review of the shop drawings by the Commissioner such shop drawings must have been reviewed and approved by the Contractor, must constitute Contractor's representation that the Contractor has verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog number and similar data with respect thereto and reviewed or coordinated each drawing and sample and with the requirements of the Work and the Contract Documents.

B. Reports and Certifications

1. Submit copies of prequalification and other welding procedures in a form and manner prescribed in AWS "Standard Qualification Procedure".

2. Submit manufacturer's certifications stating that galvanizing complies with the specified requirements.

3. Composite Deck: Submit manufacturer's shear bond and flexural test data verifying design values used.

4. Through-Deck Shear Stud Welding: Submit manufacturer's test data verifying that through-deck shear stud welding is feasible for the particular shear stud size and metal thickness to be used.

C. Calculations: Submit calculations for all deck design criteria and span conditions. Calculations must bear the seal of a Professional Engineer liscensed in the state of New York.

1. Furnish engineering calculations and test data verifying the horizontal shear capacity of shear studs for different deck types and cell configurations, as detailed on the shop drawings, including all extra studs as may be required to achieve the total horizontal shear capacity. Include stud layouts. Include deck stud layouts. Calculations must bear the seal of a Professional Engineer licensed in the State of New York.

D. Product Data: Submit, for Commissioner's information only, copies of manufacturer's specifications and installation instructions for metal deck, shear connectors, and accessories specified.

E. Statement of Acceptability: Provide a statement of acceptability from the manufacturer of products which are to be installed on the concrete fill and require venting of the metal deck for application of their products, stating that the vent openings are adequate and are not in conflict with the manufacturer's recommendations.

1. Submit a letter of certification from the deck manufacturer stating that the design and fabrication of the metal decking to be installed under this Section are in accordance with SDI "Design Manual for Floor Decks and Roof Decks".

1.5 COORDINATION

A. Consult and cooperate with subcontractors for other trades whose work affects or is affected by work under this Section in order that all phases of the work are properly coordinated to avoid delays, errors, omissions, or damage to any part of the work.

1.6 CODES AND STANDARDS

A. Comply with all applicable requirements of the latest City of New York Building Code.

B. Comply with the American Iron and Steel Institute (AISI) "Specification for the Design of Cold-Formed Steel Structural Members," latest edition.

C. Comply with the American Welding Society (AWS) "Structural Welding Code," latest edition.

D. Comply with the Steel Deck Institute (SDI) "Design Manual for Floor Decks and Roof Decks, "latest edition."

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 "Quality Requirements."

B. The manufacturer and erector must demonstrate a minimum of three (3) years of experience with the metal decking system.

C. The Contractor must employ currently qualified welding process and welding operators in accordance with AWS "Structural Welding Code" and must provide certification that welders to be employed in the work have satisfactorily passed AWS qualification and New York tests.

1.8 QUALITY CONTROL

A. Field Inspection

1. All metal decks must be inspected after erection to ascertain the following
   a. Damage of members during transportation, storage and erection.
   b. Any members not properly erected and/or connected.
   c. Welded connections (quantity and welded quality).
   d. Shear studs must be inspected as follows:
2. At the start of each day's operations for attaching shear connectors, first weld a minimum of two shear connectors in order to achieve a proper welding set-up. Then test the weld of said shear connectors by hammer-bending them to an angle 15 degrees from the vertical without weld failure.
3. Should failure occur in the weld zone of either shear connector, adjust and/or correct the welding set-up and then repeat the test. This entire test and adjustment procedure must be repeated until two consecutive shear connectors have been welded, tested and found to be satisfactory before any production welding of shear connectors is begun.
4. Where the Contract Drawings call for the attachment of shear connectors to the

supporting steel members beneath galvanized steel decking that is continuous over the said supporting steel members, perform such attachment be welding through the galvanized steel decking after achieving required procedures described herein above, and with the provision that no such welding be done through more than one thickness of steel decking at any time, except at cellular deck.

5. If, after welding, visual inspection reveals shear connectors that do not show full fusion in the weld zone, or a full 360 degree weld fillet, such shear connectors must be struck sharply with a hammer until they are bent approximately 15 degree off the vertical without weld failure. Shear connectors failing this test must be replaced at no additional cost to the City of New York.

1.9 DELIVERY, STORAGE AND HANDLING

A. Do not bend or mar decking.

B. Store off ground with one end elevated for drainage.

C. Cover decking with waterproofing material.

D. Do not store on roof framing unless material is securely tied down and the roof framing has been analyzed to ensure that such storage will not cause an overload.

PART 2 – PRODUCTS

2.1 GENERAL

A. All metal deck system elements of the same type must be the product of one manufacturer.

2.2 DESIGN

A. The Contractor must design the metal decking using the load criteria shown on the drawings and the design criteria specified herein.

B. Section properties of the metal decking units must be calculated according to the AISI procedure.

C. In cases where multi-span floor units are used, the design may be based upon uniform load conditions in all spans.

D. The metal decking deflection must not exceed 1/240 of the clear span under the uniformly distributed concrete dead load for a floor deck.

E. The metal decking must be designed in accordance with the AISI "Specification for the Design of Cold-Formed Steel Structural Members, " latest edition. The minimum positive and negative section module so obtained must be used in calculations involving positive and negative moments, respectively, in determining the required gauges of steel floor units.

F. Metal decking must carry the 20 psf of superimposed construction load. Multispan lengths of a deck must be considered as continuous members.

G. The Contractor is responsible for determining the suitability of single, double and multiple span lengths of decking for analysis and construction.

H. Moment and deflection formulas and coefficients for beams as shown in the AISC "Manual of Steel Construction, " latest edition, must be used in determining the required gauges of metal deck units.

2.3 MATERIALS

A. Steel Decking, Galvanized: ASTM A446, Grade A, Fy = 33,000 psi minimum, galvanized in accordance with ASTM A525, Coating Designation G60 for all steel decking other than roof decking. For roof decking; galvanized in accordance with ASTM A525, Coating Designation G90. Provide tabs or clips for hanging loads.

B. Basis-of-Design Product: Subject to compliance with requirements, provide steel decking by United Steel Deck, Inc., or comparable product by one of the following:

1. ASC Steel Deck
2. VERCO Decking, Inc.
3. Or approved equal.

C. Basis-of-Design Product: Subject to compliance with requirements, roof deck must be type B wide rib roof metal deck (see Contract Drawings for depth and gauge) by United Steel Deck, Inc., or comparable product by one of the following:

1. ASC Steel Deck
2. VERCO Decking, Inc.
3. Or approved equal.

D. Provide perforated deck for slabs to receive roofing or waterproofing membranes. Free area of perforations equal to not less than 1.5% of the total deck surface area.

E. Miscellaneous Steel Shapes: ASTM A36, shop prime painted, unless otherwise shown or specified.

F. Shear Connectors: ASTM A108, Grade 1010 through 1020 headed stud type, coldfinished carbon steel, AWS D1.1, Type B: through-deck stud welded shear connectors, type and size as shown.

G. Manufacturers: Subject to compliance with requirements, provide shear connectors by one of the following:

1. KSM Fastening Systems Division (Omark Industries).
2. Nelson Stud Welding Division (TRW, Inc.).
3. Blue Arc Welding Studs (Erico Products, Inc.).
4. Or approved equal.

H. Floor and roof decking must be classified by Underwriters' Laboratories, Inc. Each unit or bundle must be labeled and marked as required by UL, indicating manufacturer, testing, and inspection.

2.4 FABRICATION

A. All metal decking units must be roll-formed to assure dimensional uniformity and strength. Sufficient embossments must be provided to transfer at least twice the horizontal and vertical shearing forces in the composite slab. The minimum depth of embossments or indents must be .050".

2.5 HANGER SYSTEM

A. Provide hanger tabs along the side joints of units at 1'-0" centers. These tabs must have a minimum allowable static load capacity of at least 100 lbs. and must accommodate a flat bar hanger (no rod hangers). All hangers, their installation, and tab activation must be by trades requiring the tabs. No plastered ceilings may be hung from hanger tabs.
No mechanical loads may be hung from hanger tabs.

2.6 FLASHING

A. The manufacturer must furnish sheet metal flashings to close all openings, including openings between floor units and columns, openings where a change occurs in the direction of the floor span, etc. These flashings must be fastened in position by the steel floor erector. Provide continuous metal screed sections at the periphery of slabs at exterior walls and around edges of all openings. Screeds must have metal straps as required for support of a concrete fill.

2.7 MISCELLANEOUS MATERIALS

A. Arc-Welding Electrodes: AWS A5.1 E60XX OR E770XX Series, as required for the conditions of use.

B. Prime Paint: On field touch up of welds and field cuts must be with zinc rich coating, zinc content 95% of dry film thickness of 2 mils.

2.8 ACCESSORIES

A. ASTM A526, commercial quality, galvanized. Provide accessories of every kind required to complete the installation of metal decking in the system shown. Finish sheet metal items to match finish of decking. Include the following:

1. Cover plates to close gaps, changes in deck direction, around columns, access openings, and around openings due to the construction sequence.
2. Provisions for venting through decking for slabs which are scheduled to receive roofing or waterproofing.

3. Supplemental support framing where normal deck bearing is precluded by columns, flange plates, or other framing geometry and around minor openings, around openings due to the construction sequence and wherever required to support fireproofing.
4. Roof sump pans.
5. Sheet metal closures, pour stops and continuous edging at open ends of slabs and openings in floors and roof.
6. Hanger Anchorage Devices: Provide UL approved hanger anchorage devices for composite and form deck. Provide either slots or clips or a combination of both so that devices are spaced not more than 12 in. o.c. in both directions, not over 9 in. form walls at ends of deck, and not more than 12 in. from walls at sides of deck. Integrally punch slots into the bottom surface of the deck ribs and stagger the pattern of slots by 6 in. Furnish non-piercing type of clips designed to fit over the side lap of deck.

PART 3 – EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PRE-INSTALLATION MEETING

A. Prior to the start of the Work, and at the Contractor's direction, meet at the Project site to review material sections, methods and sequence of metal decking installation, special details and conditions, standard of workmanship, quality control requirements, job organization, coordination with other trades, and other pertinent topics related to the Work. The meeting must include the Commissioner, the Contractor's project superintendent, metal decking subcontractor's superintendent, Testing Agency, primary component material suppliers, and any other subcontractors whose work requires coordination with this Work.

3.3 CONDITION OF SURFACES

A. Examine the substrates, adjoining construction and conditions under which the Work is to be installed. Do not proceed with the Work until unsatisfactory conditions have been corrected.

B. Verify that the metal decking is free from oil or other substances, which would impair adhesion of either concrete or spray-on fireproofing. Clean decking as required to comply with requirements of spray-on fireproofing and/or concrete.

3.4 GENERAL

A. Install deck units and accessories in accordance with manufacturer's recommendations and instructions and final shop drawings.

B. Do not place deck units on concrete supporting structure until concrete has cured and is dry.

C. Coordinate with structural steel erector for delivery and location of decking bundles to prevent overloading of structural members. Do not use floor deck units for storage or working platforms until units are permanently secured.

3.5 OPENINGS

A. Cut and reinforce units to provide openings which are indicated on the Architectural, Structural, and/or Mechanical Drawings. Also, provide miscellaneous headers and other steel reinforcing and supports welded to decking and/or structural steel, which are not indicated on the drawings, as required at penetrations, around columns, etc.

B. Openings which are required for work of other trades and which are not indicated on Architectural, Structural, Mechanical Drawings must be provided only upon approval of the Commissioner as to size and location.

C. Cut and install sleeves and holes through decking for the same and cost thereof must be paid by the trade requiring such sleeves and hole. Sleeves will be furnished by the various trades requiring them. Provide and install reinforcement as required around sleeves.

D. At columns, perimeters, shafts, stairs, other openings and areas requiring field cutting, cut decking tight and provide measures and methods to assure deck can support loads. Provide tight fitting closures at open uncovered ends and edges of decking, and miscellaneous supports required to carry metal decking. Secure hole reinforcement to decking with fillet welds placed on both sides of reinforcing members. Place reinforcement channels and angles across flutes and projecting beyond sides of openings equal to maximum size of opening unless otherwise shown. Provide angles channels and other attachments required for opening through decking for ducts, shafts, piping and other penetrations. Perform field cutting and trimming square and neat and equal to factory cutting.

3.6 ERECTION

A. Erect metal in accordance with the decking manufacturers' recommendations and the requirements of the drawings and these specifications.

1. Decking installation will be subject to inspection by the testing laboratory who must certify that this work has been performed in compliance with contract requirements.

B. Place metal decking on the supporting steel framework and adjust to final position with ends accurately aligned and bearing on supporting members before permanently fastening. Do not stretch or contract sidelap interlocks.

1. End bearing must be a minimum of 2".
2. Place deck units in straight alignment for entire length of run of cells and with close alignment between the cells at ends of abutting unit. End laps must be a minimum of 2" and must occur over supports.

3. All enclosure pieces for exterior slab edge supporting curtain wall must be installed at the theoretical position with maximum tolerance of + 3/8". The closure piece must have adequate adjustments to accommodate the structural steel frame tolerances.
4. Coordinate the location of decking bundles with a structural steel erector to prevent overloading of structural members.
5. Place deck units flat and square, secured to adjacent framing without a warp or excessive deflection.
6. Do not place deck units on concrete supporting structure until concrete has cured and is dry.

C. Fasten metal decking to the steel framework at ends of units and an intermediate support.

1. Welds must be spaced at 12" on center maximum.
2. All welds must be 3/4" diameter puddle welds.

D. Fasten side laps and perimeter edges of panels between supports by button punching or side seam welding spaced at 24" on center maximum. Side laps fasteners between supports for a roof metal deck must be welded 3/4" puddle welds or 3/8" x 12" arc seam weld spaced at 24" on center maximum.

E. Also fasten all roof decks to all roof girders and/or roof truss members which support roof purlins by 3/4" puddle welds at 24" on a center along the lower valley of the deck which is parallel to the roof girders on roof truss members. Layout roof decks so that the lower valley of the deck can be fastened to the center of the roof girders or roof truss members.

F. Uplift Loading: Install and anchor roof deck units to resist gross uplift loading of 45lbs. psf at cave overhang and 30 lbs. for other roof areas.

G. All field cutting parallel with the cells must be done in the area between the cells, taking care to leave sufficient horizontal material to permit satisfactory welding to the supporting steel.

H. Shear connectors and indicated are based on the allowable shear capacities for shear connectors in concrete slabs as listed in the “Load and Resistance Factor Design Specifications for Structural Steel Buildings”. Actual shear connector capacities must be determined by tests on the type of decking supplied and the number of connectors required in each rib. If additional shear connectors are required due to decreases in the allowable shear values, provide such shear connectors.

I. Apply shear connectors in accordance with the manufacturer’s printed instructions. Use only personnel and equipment authorized by the manufacturer.

J. Use through-deck shear connector welding where gage thickness permits proper shear connector welding to develop the strength required. Provide adequate test results to verify the feasibility of through-deck shear connector welding for the particular shear connector size and garage thickness involved.

K. If through-deck shear connector welding is not feasible, install shear connectors in prepunched holes in the decking. Provide pre-punched holes only for the shear connectors involved and involved and keep hole oversize to a minimum.

3.7 WELDING

A. Qualification of Welders: Properly certified for the type of work involved in compliance with all applicable Code requirements including holding a current NYC Department of Buildings welding license.

1. Welders must be certified by the testing laboratory per New York City Department of Buildings requirements.
2. Decking welders must follow the technique outlined by the metal decking manufacturer.

3.8 FLASHING AND CLOSURES

A. Furnish, install, and weld in position, sheet metal flashing to provide closure between decking units and columns.

3.9 ROOF SUMP PANS

A. Place over openings provided in roof decking and weld to top decking surface. Space welds not more than 12 inches o.c. with at least one weld at each corner. Cut opening in roof sump bottom to accommodate drain size shown.

3.10 CLEAN-UP AND TOUCH-UP PAINTING

A. Clean up: Remove metal cuttings and construction debris. Remove grease, oil and other foreign material from metal decking which would prevent proper bonding of concrete fill, sprayed-on fireproofing or roofing materials.

B. Remove water or other foreign matter from electrical cells prior to electrification.

C. Touch-up Painting: After decking installation, wire brush, clean and paint scarred and abraded areas, welds and rust spots on top and bottom surfaces of decking units and supporting steel members.

1. Touch-up galvanized surfaces with specified galvanizing repair paint applied in accordance with ASTM A780 and manufacturer's written instructions.

END OF SECTION 05 31 00

SECTION 05 40 00 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Exterior non-load-bearing wall and soffit framing.
2. Installation accessories.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
2. Environmental Product Declaration: For each product.
3. Health Product Declaration: For each product.
4. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.

C. Shop Drawings:

1. Include layout, spacings, sizes, thicknesses, and types of cold- formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

D. Engineering Services Submittal: For cold- formed steel framing and connections, submit design calculations sealed and signed by the qualified Contractor's Professional Engineer, licensed in the State of New York responsible for their preparation.

1. Engineering services documentation will be submitted to Commissioner for review and approval prior to any incorporation into the work.

1.5 INFORMATIONAL SUBMITTALS

A. Welding certificates.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Product Tests: Mill certificates or data from a qualified independent testing agency.

C. Welding Qualifications: Comply with qualify procedures according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

D. On-site Facade Mockups: Include as part of on-site facade mockup required by other sections, as indicated on the drawings, work specified in this section. All required submittals for the work specified in this section will be submitted by the Contractor and accepted by the Commissioner prior to the Contractor furnishing elements for the on-site facade mockup.

1. Provide complete cold-formed steel framing installation in sizes, quantities, and configuration indicated on the drawings.
2. Incorporate full-scale details of the architectural features, approved finished and textures, brackets and attachment components required for installation.
3. Approval of on-site facade mockup does not constitute approval of deviations from the Contract Documents contained in the on-site facade mockup unless the Commissioner specifically approves such deviations in writing.
4. Maintain the on-site facade mockup at the project site until directed to demolish and remove the on-site facade mockup by the Commissioner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. CEMCO; California Expanded Metal Products Co.
2. ClarkDietrich.
3. MarinoWARE.
4. Or approved equal.

2.2 PERFORMANCE REQUIREMENTS

A. Engineering Services: Engage a qualified Professional Engineer licensed in the State of New York to design cold formed metal framing including connections.

1. Engineering Services will include complete design calculations for cold-formed steel framing and connections required for this project.

    a. Indicate required design loads, including live loads, wind loads, seismic loads, and dead loads and handling stresses during shipment and erection including loads from construction procedures.
    b. Design calculations will be based on Performance Requirements and product design criteria specified herein.

2.3 COLD-FORMED STEEL FRAMING MATERIALS

A. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:

1. Grade: As required by structural performance.
2. Coating: G90 or equivalent.

2.4 EXTERIOR NON-LOAD-BEARING WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:

1. Minimum Base- Metal Thickness: 0.0428 inch minimum and greater where required to meet performance requirements.
2. Flange Width: 1- 3/8 inches unless otherwise required by project application.
3. Section Properties: As required to meet performance requirements.

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and matching minimum base-metal thickness of steel studs.

C. Vertical Deflection Clips: Manufacturer's standard head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.

D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure.

2.5 SOFFIT FRAMING

A. Exterior Soffit Frame: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:

1. Minimum Base- Metal Thickness: Same as wall framing unless otherwise required to meet performance requirements.
2. Flange Width: As required by project application.
3. Section Properties: As required to meet performance requirements.

2.6 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from ASTM A1003/A1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated.

2.7 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A36/A36M, zinc coated by hot-dip process according to ASTM A123/A123M.

B. Anchor Bolts: ASTM F1554, Grade 36, threaded carbon-steel hex-headed bolts, carbon-steel nuts, and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A153/A153M, Class C.

C. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report for project substrate, acceptable to the New York City Department of Buildings.

1. Uses: Securing cold-formed steel framing to structure.
2. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.

D. Power-Actuated Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report based on ICC-ES AC70, acceptable to the New York City Department of Buildings.

E. Mechanical Fasteners: ASTM C1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.

1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.

2.8 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: ASTM A780/A780M or SSPC-Paint 20.

B. Nonmetallic, Nonshrink Grout: Factory-packaged, nonmetallic, noncorrosive, nonstaining grout, complying with ASTM C1107/C1107M, and with a fluid consistency and 30-minute working time.

C. Shims: Load bearing, high-density, multimonomer, non-leaching plastic; or cold-formed steel of same grade and metallic coating as framing members supported by shims.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, areas, conditions, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.

B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that required to obtain fire-resistance ratings indicated. Protect remaining fire-resistive materials from damage.

3.4 COLD- FORMED METAL FRAMING, GENERAL

A. Comply with combined written instructions of manufacturers, unless more stringent requirements are indicated, including those in referenced publications.

3.5 INSTALLATION, GENERAL

A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.

B. Install cold-formed steel framing according to AISI S200, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.

C. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.

D. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.

E. Install temporary bracing and supports to secure framing and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

F. Install insulation, specified in Section 07 21 00 "Thermal Insulation," in framing-assembly members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

G. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

3.6 EXTERIOR NON-LOAD-BEARING WALL INSTALLATION

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.

B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:

1. Stud Spacing: As indicated on Drawings.

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.

1. Install single deep-leg deflection tracks and anchor to building structure.
2. Install double deep-leg deflection tracks and anchor outer tracks to building structure.

E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.

F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.7 ERECTION TOLERANCES

A. Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:

1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error will not exceed minimum fastening requirements of sheathing or other finishing materials.

3.8 FIELD QUALITY CONTROL

A. Testing: Engage a qualified independent testing and inspecting agency to perform tests and inspections and prepare field reports.

B. Field and shop welds will be subject to testing and inspecting.

C. Testing agency will report test results promptly and in writing to Contractor and Commissioner.

D. Cold-formed steel framing will be considered defective if it does not pass tests and inspections.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.9 RESTORATION AND PROTECTION

A. Restoration: Prepare and restore damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, and approved by the Commissioner, to ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05 40 00

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 05 50 00 – METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section includes:

1. Steel framing and supports for countertops.
2. Attic pull-down ladder.
3. Elevator pit ladder.
4. Bulkhead ladder.
5. Steel framing and supports for mechanical and electrical equipment.
6. Aluminum overhead elevator access ladder.
7. Steel framing and supports for applications where framing and supports are not specified in other Sections.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data.

B. Sustainable Design Submittals:
1. Environmental product declaration.

C. Shop Drawings: Show fabrication and installation details for metal fabrications.

1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
2. Where metal fabrications are to comply with design loadings, include structural computations and other information needed for structural analysis that have been prepared, signed and sealed by a Connecticut licensed professional engineer licensed in the State of New York responsible for their preparation.

D. Engineering Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer licensed in the State of New York responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified professional engineer licensed in the State of New York.

B. Mill Certificates: Signed by manufacturers of stainless-steel certifying that products furnished comply with requirements.

C. Welding certificates.

D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

C. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

1.8 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages and steel weld plates and angles for casting into concrete. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance of Ladders: Provide ladders capable of withstanding the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.

B. Thermal Movements: Provide exterior metal fabrications that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by

preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.3 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Steel Tubing: ASTM A 500, cold-formed steel tubing.

C. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40) unless otherwise indicated.

2.4 STEEL LADDERS

A. General: Fabricate ladders for the locations shown, and as indicated. Comply with requirements of ANSI A14.3.

B. Side Rails: Continuous steel flat bars, 1/2 inch by 2-1/2 inches, with eased edges, spaced 24 inches apart.

C. Bar Rungs: Round steel bars, 3/4 inch diameter, spaced 12 inches o.c. Weld rungs in center of side rails and grind smooth.

D. Support each ladder at top and bottom and not more than 5 feet 0 inches o.c. by means of welded or bolted steel brackets.

1. Size brackets to support dead and live loads and to hold centerline of ladder clear of the wall by not less than 7 inches.
2. Extend side rails 42 inches above top rung and return rails unless other handholds are provided. If the adjacent structure does not extend above the top rung, goose-neck the extended rails back to the structure to provide secure access.

E. Provide either non-slip surface on top of each rung, or by coating the rung with aluminum oxide granules set in epoxy resin adhesive.

2.5 ATTIC PULL-DOWN LADDER

A. Basis of Design Product: Subject to compliance with requirements, provide Metallic Attic Ladder LMF as manufactured by Fakro, or comparable product by one of the following:

1. Rainbow Attic Stairs.
2. Louisville Ladders.
3. Or approved equal.

B. Characteristics:

1. Model 869237.
2. Certification: ANSI A14.9 (2010).
3. Size: 8 to 10 feet.
4. Style: Folding.
5. Rough opening: 30 by 54 inches.
6. Load capacity: 375 lbs.
7. Ladder width: 15 inches.
8. Locking device: Gas strut.
9. Opening device: rope.

2.6 ALUMINUM LADDERS

A. Aluminum Ladders:

1. Basis of Design Product: Subject to compliance with requirements, provide heavy duty exterior fixed wall ladder model 561 as manufactured by Alaco, or comparable product by one of the following:
   a. Halliday Products.
   b. O'Keeffe's Inc.
   c. Or approved equal.

2. Source Limitations: Obtain aluminum ladders from single source from single manufacturer.
3. Space siderails 20 ¼ inch apart unless otherwise indicated.
4. Siderails: Continuous extruded-aluminum channels or tubes, not less than 2-1/2 inches deep, 3/4 inch wide, and 1/8 inch thick.
5. Rungs: Extruded-aluminum tubes, not less than 3/4 inch deep and not less than 1/8 inch thick, with ribbed tread surfaces.
6. Fit rungs in centerline of siderails; fasten by welding or with stainless steel fasteners or brackets and aluminum rivets.
7. Provide platforms as indicated fabricated from pressure-locked aluminum bar grating or extruded-aluminum plank grating, supported by extruded-aluminum framing. Limit openings in gratings to no more than 3/4 inch in least dimension.
8. Support ladder at top and bottom and not more than 60 inches o.c. with welded or bolted aluminum brackets.
9. Finish: Mill finish unless otherwise indicated.

2.7 FASTENERS

A. General: Unless otherwise indicated, provide Type 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.

C. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 325, Type 3 (ASTM A 325M, Type 3); with hex nuts, ASTM A 563, Grade C3 (ASTM A 563M, Class 8S3); and, where indicated, flat washers.

D. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593 (ASTM F 738M); with hex nuts, ASTM F 594 (ASTM F 836M); and, where indicated, flat washers; Alloy Group 1 (A1), or Group 2 (A4) where applicable.

E. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.

1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

F. Eyebolts: ASTM A 489.

G. Machine Screws: ASME B18.6.3 (ASME B18.6.7M).

H. Lag Screws: ASME B18.2.1 (ASME B18.2.3.8M).

I. Wood Screws: Flat head, ASME B18.6.1.

J. Plain Washers: Round, ASME B18.22.1 (ASME B18.22M).

K. Lock Washers: Helical, spring type, ASME B18.21.1 (ASME B18.21.2M).

L. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

M. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

N. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
2. Material for Exterior Locations and Where Stainless Steel is Indicated: Alloy Group 2 (A4) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).

2.8 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Shop Primers: Provide primers that comply with Section 09 91 00 “Painting”.

C. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
   1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

E. Non-shrink, Metallic Grout: Factory-packaged, ferrous-aggregate grout complying with ASTM C 1107, specifically recommended by manufacturer for heavy-duty loading applications.

F. Non-shrink, Nonmetallic Grout: Factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.9 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:

   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated, coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

2.10 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

1. Fabricate units from slotted channel framing where indicated.
2. Furnish inserts for units installed after concrete is placed.

C. Fabricate supports for operable partitions from continuous steel beams of sizes recommended by partition manufacturer with attached bearing plates, anchors, and braces as recommended by partition manufacturer. Drill or punch bottom flanges of beams to receive partition track hanger rods; locate holes where indicated on operable partition Shop Drawings.

D. Galvanize miscellaneous framing and supports where indicated.

2.11 SUPPORTS FOR COUNTERTOPS:

A. Basis of design product: Subject to compliance with requirements, provide cold rolled steel L shaped brace #30056 as manufactured by Federal Brace, or comparable product by one of the following:

1. Hampton Bay.
2. Centerline Brackets.
3. Or approved equal.

B. Additional Product Requirements:

1. Dimensions: 16 inches by 16 inches by 3.8 inch.
2. Color: White, or painted finish as indicated.

2.12 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.13 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

C. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.14 STEEL AND IRON FINISHES

A. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.

B. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:
1. Items Indicated to Receive Primers Specified in Division 09 Section "Painting": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Other Items: SSPC-SP 3, "Power Tool Cleaning."

C. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

2.15 ALUMINUM FINISHES

A. As-Fabricated Finish: AA-M12.

B. Clear Anodic Finish: AAMA 611, Class I, AA-M12C22A41.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:

1. Cast Aluminum: Heavy coat of bituminous paint.
2. Extruded Aluminum: Two coats of clear lacquer.

3.3 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

B. Anchor supports for operable partitions securely to and rigidly brace from building structure.

C. Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.
1. Where grout space under bearing plates is indicated for girders supported on concrete or masonry, install as specified in "Installing Bearing and Leveling Plates" Article.

D. Install pipe columns on concrete footings with grouted baseplates. Position and grout column baseplates as specified in "Installing Bearing and Leveling Plates" Article.

1. Grout baseplates of columns supporting steel girders after girders are installed and leveled.

3.4 INSTALLING BEARING AND LEVELING PLATES

A. Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of plates.

B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.

1. Use non-shrink grout, either metallic or nonmetallic, in concealed locations where not exposed to moisture; use non-shrink, nonmetallic grout in exposed locations unless otherwise indicated.
2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.5 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 91 00 “Painting”.

END OF SECTION 05 50 00

SECTION 05 52 13 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section includes:

1. Steel pipe and tube handrails and railings for interior areas.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: Submit product data that verify or are required to ensure compliance with the Contract Documents, to include technical information, shop drawings, samples, calculations, product test reports, etc.

B. Shop Drawings: Show fabrication and installation of handrails and railings. Include plans, elevations, sections, details, and attachments to other Work.

C. Samples: For each type of exposed finish required.

1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
2. Fittings and brackets.

1.5 INFORMATIONAL SUBMITTALS

A. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

B. Welding Certificates: Submit certificates signed by the Contractor showing compliance with AWS and local standards.

C. Engineering Services Submittal: For railings, including analysis data signed and sealed by the professional engineer licensed in the State of New York responsible for their preparation.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Engineer Qualifications: Professional engineer legally authorized to practice in the State of New York and experienced in providing engineering services of the kind indicated for ornamental handrails and railings similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

C. Source Limitations: Obtain each type of railing from single source from single manufacturer.

D. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1, "Structural Welding Code - Steel."

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

1.8 COORDINATION

A. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

B. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Engineering Services: Engage a qualified professional engineer, licensed in the State of New York, to design railings, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:

1. Steel: 72 percent of minimum yield strength.

C. Structural Performance: Railings must withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ft applied in any direction.
b. Concentrated load of 200 lbf applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
b. Infill load and other loads need not be assumed to act concurrently.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on interior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 80 deg F, ambient; 120 deg F, material surfaces.

E. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

2.2 STEEL AND IRON

A. Tubing: ASTM A 500 (cold formed) or ASTM A 513.

B. Pipe: ASTM A 53, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

C. Plates, Shapes, and Bars: ASTM A 36.

D. Cast Iron: Either gray iron, ASTM A 48, or malleable iron, ASTM A 47, unless otherwise indicated.

2.3 FASTENERS

A. General: Provide the following.

1. Interior Painted Steel Railings: Plated steel fasteners complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5 for zinc coating.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Fasteners for Interconnecting Railing Components:

1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
2. Provide tamper-resistant square or hex socket flat-head machine screws for exposed fasteners unless otherwise indicated.

D. Post-Installed Anchors: Torque-controlled expansion anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

1. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.

2.4 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer; and compatible with topcoat.

1. Refer to Division 09 Section 09 91 00 “Painting” for additional requirements.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

E. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior applications.

F. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

2.5 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form works true to line and level with accurate angles and surfaces.

E. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with welded connections unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

I. Form changes in direction as follows:

1. By bending or by inserting prefabricated elbow fittings.

J. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

K. Close exposed ends of railing members with prefabricated end fittings.

L. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4inch or less.

M. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers, or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.

N. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

O. For railing posts set in concrete, provide steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.

2.6 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

2.7 STEEL AND IRON FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal railings after assembly.

C. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

D. Apply shop primer to uncoated surfaces of metal railings components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

E. Field Applied Finish: Refer to Section 09 91 00 “Painting” for materials and requirements of field applied paint finishes.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for pipe and tube railing Installer. Locate reinforcements and mark locations if not already done.

3.3 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.

3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

C. Adjust railings before anchoring to ensure matching alignment at abutting joints.

D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.4 RAILING CONNECTIONS

A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

B. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

3.5 ANCHORING POSTS

A. Use metal sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material.

C. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:

1. For steel stair pipe railings, weld flanges of stringer to post.

D. Install removable railing sections, where indicated, in slip-fit metal sockets cast in concrete.

3.6 ATTACHING RAILINGS

A. Where indicated, anchor railing ends at walls with round flanges anchored to wall construction and welded to railing ends. Otherwise return railing to wall leaving 1/2 inch gap.

B. Attach railings to wall with wall brackets, except where end flanges are used. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt or predrilled hole for exposed bolt anchorage.

2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

C. Secure wall brackets and railing end flanges to building construction as follows:

1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
2. For steel-framed partitions, use self-tapping screws or toggle bolts secured to steel framing or to concealed steel reinforcements.

3.7 ADJUSTING AND CLEANING

A. Clean stainless steel by washing thoroughly with clean water and soap and rinsing with clean water.

B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

3.8 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION 05 52 13

SECTION 05 58 00 – FORMED METAL FABRICATIONS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Metal edging.
2. Metal Bollard.
3. Fasteners.

B. Products furnished, but not installed, under this Section include the following:

1. Anchor bolts, steel pipe and tube sleeves, slotted – channel inserts, and wedge –type inserts, as indicated.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For the following:

1. ADA Release Button.

B. Sustainable Design Submittals:

1. Environmental product declaration.

C. Samples:

1. Provide 6-inch square Samples of metal edging with applied finish for approval by The Commissioner.
2. 12-inch- long-by-actual-width Samples of fascia trim and anchorage accessories.

D. Shop Drawings: Fully engineered Shop Drawings that show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Contractor's licensed New York City Professional Engineer licensed to the State of New York to submit Shop Drawings for metal framing and parts required for installation of the following:

1. Metal edging, including placement and dimensions of lighting channels.
2. Metal facia, including placement of framing and fasteners.
3. Anchorages.

    a. Coordinate anchorages and z-clip fastening systems with the work of Division 03 Section 03 30 00 "Cast-In-Place Concrete".
    b. Coordinate anchorages for edging with final placement and planting of trees and shrubs.

1.5 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Research Reports: For post-installed anchors.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Fabricator Qualifications: Firm experienced in producing metal fabrications similar to those indicated for this Project with a record of successful in service performance, and with sufficient production capacity to produce required units without delaying the Work.

C. Welding Standards: Comply with applicable provisions of the following:

1. AWS D1.1 "Structural Welding Code – Steel"
2. AWS D1.2 "Structural Welding Code – Aluminum"
3. AWS D1.3 "Structural Welding Code – Sheet Steel."

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls, pathways, sidewalks and property lines prior to installation.

1.8 COORDINATION

A. Consult and cooperate with subontractors for other trades for locations and placement of devices provided by other trades in order that all phases of the work are properly coordinated to avoid delays, errors, omissions or damage to any part of the work.

B. Coordinate sizes and locations of signage, back boxes, security devices and other units of work specified under other Sections and provided by other trades to confirm layout of devices and all penetrations on the metal Bollard. Coordinate construction of openings and all penetrating items.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 MANUFACTURERS

A. Custom Stainless Steel Edging: Standard finish, extruded in standard lengths, with steel stakes and shims where indicated on the Drawings.

1. Edging Size: As indicated on Drawings.
2. Top Profile: As indicated on the Drawings.
3. Accessories: Alignment of inner and outer corners, clips or plugs.

B. Custom Stainless-steel Bollard: Stainless as shown on drawings, with required openings and applied signage. Anchorage as noted.

2.3 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.4 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

1. Provide stainless-steel fasteners for fastening aluminum.
2. Provide stainless-steel fasteners for fastening stainless steel.

B. Installed Anchors: Torque-controlled expansion anchors or chemical anchors.

1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

2.5 MISCELLANEOUS MATERIALS

A. Universal Shop Primer: Fast-curing, lead and chromate-free, universal modified-alkyd primer compatible with topcoat.

1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

B. Water-Based Primer: Emulsion type, anticorrosive primer for mildly corrosive environments that is resistant to flash rusting when applied to cleaned steel, compatible with topcoat.

C. Epoxy Zinc-Rich Primer: Compatible with topcoat.

D. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

F. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.6 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.

C. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended.

D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Locate joints where least conspicuous.

E. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

F. Where units are indicated to be cast into concrete, equip with integrally welded steel strap anchors not less than 8 inches from ends and corners of units and 24 inches o.c..

2.7 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

2.8 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

C. Prime exterior miscellaneous steel trim with zinc-rich primer.

2.9 FINISHES, GENERAL

A. Metal edging must be standard finish as provided by the approved vendor. Finish must be reviewed and approved by the Commissioner.

2.10 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.

B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, or unless otherwise indicated.

C. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Comply with approved Shop Drawings.

3.3 ADJUSTING AND CLEANING

A. Clean field welds, bolted connections, and abraded areas and repair surface finishes to match original finish.

END OF SECTION 05 80 00

SECTION 05 73 00 - DECORATIVE METAL RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Stainless steel decorative railings.

1.3 COORDINATION AND SCHEDULING

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry, and to be attached to curtain wall mullions where indicated. Deliver items to Project site in time for installation.

1. Refer to Section 08 44 13 "Glazed Aluminum Curtain Walls" for additional requirements.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 COORDINATION AND SCHEDULING

A. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, anchor bolts, and items with integral anchors. Deliver items to Project site in time for installation.

1.6 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 "Submittal Procedures."

1.7 ACTION SUBMITTALS

A. Product Data:

1. Manufacturer's product lines of decorative metal railings assembled from standard components.
2. Stainless steel fittings.
3. Fasteners.
4. Post-installed anchors.
5. Nonshrink, nonmetallic grout.
6. Anchoring cement.
7. Metal finishes.

B. Shop Drawings: Include plans, elevations, sections, and attachment details.

C. Samples for Verification: For each type of exposed finish required.

1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters
2. Fittings, end caps, and brackets.
3. Hardware and connections.
4. Assembled Sample of railing system, made from full-size components, including top rail, and stanchion support. Sample need not be full height.

a. Show method of connecting and finishing members at intersections.

D. Engineering Services Submittal: For railings, including analysis data signed and sealed by the qualified, New York State licensed professional engineer responsible for their preparation.

1.8 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer licensed in the State of New York.

B. Mill Certificates: Signed by manufacturers of stainless-steel products, certifying that products furnished comply with requirements.

C. Product Test Reports: For tests on railings performed by a qualified testing agency, in accordance with ASTM E894 and ASTM E935.

1.9 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 "Quality Requirements."

B. Welding Qualifications: Qualify procedures and personnel in accordance with the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

C. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Build mockups for each form and finish of railing, consisting of two posts, top rail, infill area, and anchorage system components that are full height and are not less than 24 inches in length.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Protect mechanical finishes on exposed surfaces of railings from damage by applying a strippable, temporary protective covering before shipping.

1.11 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Engineering Services: Engage a qualified professional engineer licensed in the State of New York, as defined in DDC General Conditions, to design railings, including attachment to building construction.

B. Structural Performance: Railings, including attachment to building construction, will withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ft.0.73 kN/m applied in any direction.
b. Concentrated load of 200 lbf0.89 kN applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

a. Concentrated load of 50 lbf0.22 kN applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
b. Infill load and other loads need not be assumed to act concurrently.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior railings by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Same metal and finish as supported rails unless otherwise indicated.

2.3 STAINLESS STEEL DECORATIVE RAILINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Blum, Julius & Co., Inc.
2. C.R. Laurence Co., Inc.
3. Kane Innovations, Inc.
4. VIVA Railings, LLC.
5. Or approved equal.

B. Source Limitations: Obtain stainless steel decorative railing components from single source from single manufacturer.

C. Tubing: ASTM A554, Grade MT 304 where indicated, Grade MT 316 where indicated.

D. Pipe: ASTM A312/A312M, Grade TP 304 where indicated, Grade TP 316 where indicated.

E. Castings: ASTM A743/A743M, Grade CF 8 or CF 20.

F. Plate, Sheet, and Strip: ASTM A240/A240M or ASTM A666, Type 304.

G. Flat Bar: ASTM A666, Type 316.

2.4 FASTENERS

A. Fastener Materials:

1. Stainless Steel Railing Components: Type 316 stainless steel fasteners.
2. Dissimilar Metal Railing Components: Type 316 stainless steel fasteners.
3. Finish exposed fasteners to match appearance, including color and texture, of railings.

B. Fasteners for Anchoring to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction and capable of withstanding design loads.

C. Provide concealed fasteners for interconnecting railing components and for attaching railings to other work unless exposed fasteners are unavoidable.

1. Provide tamper-resistant flat-head machine screws for exposed fasteners unless otherwise indicated.

D. Post-Installed Anchors: Fastener systems with working capacity greater than or equal to the design load, in accordance with an evaluation report acceptable to Commissioner, based on ICC-ES AC193.

1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless steel bolts, ASTM F593 and nuts, ASTM F594.

2.5 FABRICATION

A. Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Shop assembles railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations.

1. Clearly mark units for reassembly and coordinated installation.
2. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately.

1. Remove burrs and ease edges to a radius of approximately 1/32 inch 1 mm unless otherwise indicated.
2. Remove sharp or rough areas on exposed surfaces.

D. Form works true to line and level with accurate angles and surfaces.

E. Fabricate connections that will be exposed to weather in a manner to exclude water.

1. Provide weep holes where water may accumulate.
2. Locate weep holes in inconspicuous locations.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with mechanical connections unless otherwise indicated.

H. Mechanical Connections: Connect members with concealed mechanical fasteners and fittings.

1. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
2. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.

I. Brackets, Flanges, Fittings, and Anchors: Provide brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other Work unless otherwise indicated.

J. Provide inserts and other anchorage devices for connecting railings to concrete or masonry Work.

1. Fabricate anchorage devices capable of withstanding loads imposed by railings.
2. Coordinate anchorage devices with supporting structure.

2.6 GENERAL FINISH REQUIREMENTS

A. Comply with National Association of Architectural Metal Manufacturers "Metal Finishes Manual for Architectural and Metal Products" recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.

C. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

2.7 STAINLESS STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

1. Run grain of directional finishes with long dimension of each piece.
2. When polishing is completed, passivate and rinse surfaces.
3. Remove embedded foreign matter and leave surfaces chemically clean.

C. Stainless Steel Sheet and Plate including Flat Bar Finishes:

1. No. 4 finish is equivalent to a 120- to 180-grit polished finish.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine concrete and plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.3 INSTALLATION, GENERAL

A. Perform cutting, drilling, and fitting required for installing railings.

1. Fit exposed connections together to form tight, hairline joints.
2. Install railings level, plumb, square, true to line; without distortion, warp, or rack.

3. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.
4. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
5. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
6. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (6 mm in 3 m).

B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

C. Adjust railings before anchoring to ensure matching alignment at abutting joints.

D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.4 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws, using plastic cement filler colored to match finish of railings.

3.5 ANCHORING STANCHIONS

A. Anchor stanchions to surfaces with flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:

B. For stainless steel railings, weld flanges to stanchions and bolt to supporting surface.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections and to prepare test reports.

B. Extent and Testing Methodology: Testing agency must randomly select completed railing assemblies for testing that are representative of different railing designs and conditions in the completed Work. Test railings in accordance with ASTM E894 and ASTM E935 for compliance with performance requirements.

C. Remove and replace railings where test results indicate that they do not comply with specified requirements unless they can be repaired in a manner satisfactory to Commissioner and comply with specified requirements.

D. Perform additional testing and inspecting, at Contractor's expense, to determine compliance of replaced or additional work with specified requirements.

3.7 CLEANING

A. Clean stainless steel by washing thoroughly with clean water and soap, rinsing with clean water, and wiping dry.

3.8 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period, so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit or provide new units.

END OF SECTION 05 73 00

SECTION 05 73 13 - GLAZED DECORATIVE METAL RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Glazed decorative metal railings.

1.3 DEFINITIONS

A. Railings: Guards, handrails, and similar devices used for protection of occupants at open-sided floor and exterior deck areas and for pedestrian guidance and support, visual separation, or wall protection.

1.4 COORDINATION AND SCHEDULING

A. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver items to Project site in time for installation.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.6 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.7 ACTION SUBMITTALS

A. Product Data:

1. Metal railings assembled from standard components.
2. Glass products.
3. Glazing cement and accessories for railings.
4. Fasteners.
5. Shop primer.

6. Bituminous paint.
7. Nonshrink, nonmetallic grout.
8. Anchoring cement.

B. Shop Drawings: Include plans, elevations, sections, and attachment details.

C. Samples for Initial Selection: For products involving selection of color, texture, or design, including mechanical finishes.

D. Samples for Verification: For each type of exposed finish required.

1. Sections of each distinctly different linear railing member, including handrails, top rails, and posts.
2. Base channel.
3. Each type of glass and glass edge required.
4. Fittings and brackets.
5. Assembled Samples of railing systems, made from full-size components, including top rail, post, handrail, and glass-infill panels. Show method of finishing members at intersections. Samples need not be full height.

E. Engineering Services Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer licensed in the State of New York responsible for their preparation.

1.8 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer licensed in the State of New York.

B. Mill Certificates: Signed by manufacturers of stainless-steel products, certifying that products furnished comply with requirements.

C. Product Test Reports: For tests performed by a qualified testing agency, in accordance with ASTM E894, ASTM E935, ASTM E2353, and ASTM E2358.

D. Evaluation Reports: From ICC-ES or other qualified testing agency acceptable to the New York City Department of Buildings.

1. For glazed decorative metal railings.

1.9 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.10 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.11 WARRANTY

A. Manufacturer's Special Warranty for Laminated Glass: Glazed decorative metal railing manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Engineering Services: Engage a qualified professional engineer, licensed in the State of New York to design glazed decorative metal railings, including attachment to building construction.

B. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:

1. Stainless Steel: 60 percent of minimum yield strength.
2. Steel: 72 percent of minimum yield strength.
3. Glass: 25 percent of mean modulus of rupture (50 percent probability of breakage), as listed in "Mechanical Properties" in AAMA CW-12, "Structural Properties of Glass."

C. Structural Performance: Railings, including attachment to building construction, are to withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ft. applied in any direction.
b. Concentrated load of 200 lbf applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 GLAZED DECORATIVE METAL RAILINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. C.R. Laurence Co., Inc.; CRH Americas, Inc.

2. Glass Vice USA.
3. Tri Tech, Inc.
4. Or approved equal.

B. Source Limitations for Laminated Glass: Obtain from single source from single manufacturer.

C. Source Limitations for Decorative Metal Railing Components: Obtain from single source from single manufacturer for each component and installation method.

D. Product Options: Information on Drawings and in the Specifications establishes requirements for railing system's aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

1. Do not change intended aesthetic effects, as judged solely by Commissioner, except with Commissioner's approval. If changes are proposed, submit comprehensive explanatory data to Commissioner for review.

2.3 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Same metal and finish as supported rails unless otherwise indicated.

2.4 STAINLESS STEEL

A. Tubing: ASTM A554, Grade MT 316.

B. Pipe: ASTM A312/A312M, Grade TP 316.

C. Sheet, Strip, Plate, and Flat Bar: ASTM A666 or ASTM A240/A240M, Type 316.

D. Bars and Shapes: ASTM A276, Type 316.

2.5 STEEL AND IRON

A. Tubing: ASTM A500/A500M (cold formed) or ASTM A513/A513M.

B. Bars: Hot-rolled, carbon steel complying with ASTM A29/A29M, Grade 1010.

2.6 GLASS AND GLAZING PRODUCTS, GENERAL

A. Glazing Publications: Comply with written instructions of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. NGA/GANA Publications: "GANA Laminated Glazing Reference Manual" and "GANA Glazing Manual."

B. Safety Glazing: Glazing is to comply with 16 CFR 1201, Category II.

C. Safety Glazing Labeling: Permanently mark glass with certification label of the SGCC or another certification agency acceptable to the New York City Department of Buildings. Label is to indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

D. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear), low-iron clear, as indicated, Quality-Q3.

E. Glazing Gaskets for Glass-Infill Panels: Glazing gaskets and related accessories as recommended or supplied by railing manufacturer for installing glass-infill panels in post-supported railings.

2.7 GLASS HANDRAILS AND GUARDS

A. Tempered Glass Handrails: Provide products that have been tested for surface and edge compression in accordance with ASTM C1048 and for impact strength in accordance with 16 CFR 1201 for Category II materials.

1. Glass Color: Clear.
2. Glass Thickness: As indicated on Drawings.

B. Laminated Glass Handrails and Guards: ASTM C1172, Type II with two plies of glass bonded together by an interlayer.

1. Construction: Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturer's written instructions.
2. Interlayer Thickness: 0.060 inch.
3. Kind: LT (laminated tempered).
4. Glass Color: Inner-ply low-iron clear; outer-ply low-iron clear.
5. Interlayer Color: Clear.

2.8 FASTENERS

A. Fastener Materials: Unless otherwise indicated, provide the following:

1. Stainless Steel Components: Type 316 stainless steel fasteners.
2. Dissimilar Metals: Type 316 stainless steel fasteners.

B. Fasteners for Anchoring to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Provide concealed fasteners for interconnecting railing components and for attaching railings to other trades unless otherwise indicated.

1. Provide tamper-resistant flat-head machine screws for exposed fasteners unless otherwise indicated.

2.9 MISCELLANEOUS MATERIALS

A. Handrail Brackets: Stainless steel, dimensions as shown.

B. Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79.

C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

E. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

2.10 FABRICATION OF METAL RAILINGS

A. Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form works true to line and level with accurate angles and surfaces.

E. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate. Locate weep holes in inconspicuous locations.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Mechanical Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.

H. Form changes in direction as follows:

1. As detailed.
2. By bending to smallest radius that will not result in distortion of railing member.

I. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

J. Close exposed ends of hollow railing members with prefabricated end fittings.

K. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, handrail brackets, miscellaneous fittings, and anchors to interconnect railing members to other work where indicated.

2.11 FABRICATION OF GLASS PANELS

A. Fabricate glass to sizes and shapes required; provide for proper edge clearance and bite on glazing panels.

B. Glass-Infill Panels: Provide laminated, tempered glass-infill panels.

1. Edge Finish: Clean-cut or flat-grind edges to produce smooth, square edges with slight chamfers at junctions of edges and faces.

2.12 METAL FINISH REQUIREMENTS, GENERAL

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

2.13 STAINLESS STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

1. Run grain of directional finishes with long dimension of each piece.
2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

C. Stainless Steel Tubing Finishes:

1. 180-Grit Polished Finish: Uniform, directionally textured finish.

D. Stainless Steel Sheet, Strip, Plate, and Bar Finishes:

1. Directional Satin Finish: ASTM A480/A480M, No. 4.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION, GENERAL

A. Comply with Drawings and manufacturer's written instructions for installing glazed decorative metal railings, accessories, and other components.

B. Perform cutting, drilling, and fitting required for installing metal railings.

1. Fit exposed connections together to form tight, hairline joints.
2. Install railings level, plumb, square, true to line, without distortion, warp, or rack.
3. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.
4. Do not weld, cut, or abrade surfaces of metal railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
5. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
6. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1. Coat concealed surfaces of that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with bituminous paint.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 METAL RAILING CONNECTIONS

A. Nonwelded Connections:

1. Use mechanical or adhesive joints for permanently connecting railing components.
2. Use wood blocks and padding to prevent damage to railing members and fittings.

3. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

B. Expansion Joints: Install expansion joints at locations indicated, but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

3.4 METAL ANCHORING POSTS

A. Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted in sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.

C. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material.

D. Leave anchorage joint exposed with anchoring material flush with adjacent surface.

E. Anchor posts to metal surfaces with flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:

1. For stainless steel railings, weld flanges to posts and bolt to metal-supporting surfaces.

F. Install removable railing sections, where indicated, in slip-fit metal sockets cast in concrete.

3.5 INSTALLATION OF GLAZED DECORATIVE METAL RAILINGS

A. Post-Supported Railings with Glass-Infill Panels:

1. Install assembly to comply with railing manufacturer's written instructions and with requirements in other Part 3 articles.
2. Erect posts and other metal railing components and set factory-cut glass-infill panels.
3. Do not cut, drill, or alter glass-infill panels in field. Protect edges from damage.

3.6 CLEANING

A. Clean aluminum and stainless steel by washing thoroughly with water and soap, rinsing with clean water, and wiping dry.

B. Clean and polish glass as recommended in writing by manufacturer. Wash both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion.

3.7 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit or provide new units.

END OF SECTION 05 73 13

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Wood blocking, cants, and nailers.
2. Wood furring.
3. Plywood backing panels.
4. Plywood walkway surfaces.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product.

B. Sustainable Design Submittals:

1. Environmental Product Declaration (EPD): For each product.
2. Chain-of-Custody Qualification Data: For manufacturer and vendor.
3. Laboratory Test Reports: For composite wood products, indicating compliance with requirements for low-emitting materials.
4. Product Data: For installation adhesives, indicating VOC content.
5. Laboratory Test Reports: For installation adhesives, indicating compliance with requirements for low-emitting materials.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested and is acceptable to the New York City Department of Buildings and New York City Fire Department.

C. Inspection Agencies: Inspection agencies and the abbreviations used to reference them with lumber grades and species include the following:

1. SPIB - Southern Pine Inspection Bureau.
2. WCLIB - West Coast Lumber Inspection Bureau.
3. WWPA - Western Wood Products Association.

D. Grade Stamps: Provide lumber with each piece factory-marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
4. Provide dressed lumber, S4S, unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA C2, except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).

1. Preservative Chemicals: Approved products containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat all rough carpentry that has not been fire-retardant-treated, unless otherwise indicated.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. Identify fire-retardant-treated wood with appropriate classification marking of Testing and Inspecting agency. Comply with performance requirements in AWPA C20 (lumber) and AWPA C27 (plywood).

1. Use treatment for which chemical manufacturer publishes physical properties of treated wood after exposure to elevated temperatures, when tested by a qualified independent testing agency according to ASTM D 5664, for lumber and ASTM D 5516, for plywood.
2. Use Exterior type for exterior locations and where indicated.
3. Use Interior Type A High Temperature (HT), unless otherwise indicated.
4. Comply with 2014 New York City Building Code.
5. Products: Subject to compliance with requirements, provide one of the following:

a. Hickson Corporation; "Dricon,".
b. Hoover Treated Wood Products; "Pyro-Guard,".
c. Osmose Wood Preserving Co, Inc; "Flameproof LHC-HTT".
d. Or approved equal.

B. Application: Treat all rough carpentry, unless otherwise indicated.

1. Concealed blocking.
2. Roof construction.
3. Plywood backing panels.

2.4 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Cants.
4. Furring.
5. Grounds.

B. For items of dimension lumber size, provide Standard, Stud, or No. 3 grade lumber with 15 percent maximum moisture content of any species.

C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used if it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

E. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.5 PLYWOOD BACKING PANELS

A. IT Room and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.

2.6 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

2.7 MISCELLANEOUS MATERIALS

A. Adhesives for Gluing Furring to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.

1. Adhesives must have a VOC content of 70 g/L or less.
2. Adhesive must comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

B. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c

C. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal- thickness.
3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. and to solidly fill space below partitions.
4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet o.c.

D. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

E. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

F. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Fastening Schedule: As per 2014 New York City Building Code.

G. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.

3.3 WOOD GROUND, SLEEPER, BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.4 WOOD FURRING INSTALLATION

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal- size furring horizontally and vertically at 24 inches o.c.

C. Furring to Receive Gypsum Board: Install 1-by-2-inch nominal- size furring vertically at 16 inches o.c.

3.5 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 06 10 00

SECTION 06 16 00 - SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Wall sheathing.
2. Sheathing joint and penetration treatment.
3. Roof Sheathing.
4. Subflooring.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product.

1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Include physical properties of treated materials.
2. For fire-retardant treatments, include physical properties of treated plywood both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency in accordance with ASTM D5516.

B. Sustainable Design Submittals:

1. Chain-of-Custody Certificates: For certified wood products. Include statement of costs.
2. Chain-of-Custody Qualification Data: For manufacturer and vendor.
3. Laboratory Test Reports: For composite wood products, indicating compliance with requirements for low-emitting materials.
4. Product Data: For installation adhesives, indicating VOC content.
5. Laboratory Test Reports: For installation adhesives, indicating compliance with requirements for low-emitting materials.

1.5 INFORMATIONAL SUBMITTALS

A. Product Certificates: From water-resistant glass-mat gypsum sheathing manufacturer, certifying compatibility of sheathing accessory materials with Project materials that connect to or that come in contact with the sheathing.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

1.7 DELIVERY, STORAGE, AND HANDLING

A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Ratings: As tested according to ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 FIRE-RETARDANT-TREATED PLYWOOD

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to New York City Department of Buildings and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested in accordance with ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

1. Use treatment that does not promote corrosion of metal fasteners.
2. Exterior Type: Treated materials comply with requirements specified above for fire-retardant-treated plywood by pressure process after being subjected to accelerated weathering in accordance with ASTM D2898. Use for exterior locations and where indicated.
3. Design Value Adjustment Factors: Treated lumber plywood are to be tested in accordance with ASTM D5516, and design value adjustment factors are to be calculated in accordance with ASTM D6305. Span ratings after treatment are not to be less than span ratings specified.

C. Kiln-dry material after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or does not comply with requirements for untreated material.

D. Identify fire-retardant-treated plywood with appropriate classification marking of qualified testing agency.

E. Application: Treat all plywood unless otherwise indicated.

1. Subflooring and underlayment for raised platforms.

2.3 WALL SHEATHING

A. Glass-Mat Gypsum Wall Sheathing: ASTM C 1177/1177M.

B. Products: Subject to compliance with requirements, provide one of the following:

1. CertainTeed Gypsum; CertainTeed GlasRoc Type X Sheathing.
2. Continental Building Products, LLC; Weather Defense.
3. Georgia-Pacific Gypsum LLC; Dens-Glass Gold.
4. National Gypsum Company; Gold Bond eXP Extended Exposure Sheathing.
5. USG Corporation; Securock.
6. Or approved equal.

C. Type and Thickness: Type X, 5/8 inch thick.

D. Size: 48 by 96 inches for vertical installation.

2.4 SUBFLOORING

A. Plywood Subflooring: Either DOC PS 1 or DOC PS 2, Exposure 1, Structural I, fire rated, single-floor panels or sheathing.

1. Span Rating: Not less than 24 or 48/24.
2. Nominal Thickness: Not less than 23/32 inch.
3. Edge Detail: Tongue and groove.

2.5 MARINE GRADE PLYWOOD SHEATHING

A. Marine Grade Plywood: Exterior, APA B-B MARINE Grade, with exterior glue.

1. Span Rating: Not less than 16/0.
2. Nominal Thickness: As indicated on the Drawings.

2.6 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. For sheathing, provide fasteners of Type 304 stainless steel.

B. Power-Driven Fasteners: NES NER-272.

C. Screws for Fastening Wood sheathing to Cold-Formed Metal Framing: ASTM C954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

D. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing board to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.

1. For steel framing less than 0.0329-inch-thick, attach sheathing to comply with ASTM C 1002.
2. For steel framing from 0.033 to 0.112-inch-thick, attach sheathing to comply with ASTM C 954.

2.7 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

A. Sealant for Glass-Mat Gypsum Sheathing Board: Silicone emulsion sealant complying with ASTM C 834, compatible with sheathing tape and sheathing, and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.

B. Sheathing Tape for Glass-Mat Gypsum Sheathing Board: Self-adhering glass-fiber tape, minimum 2 inches wide, 10 by 10 or 10 by 20 threads/inch, of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing board and with a history of successful in-service use.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.

2. Chapter 14, "Exterior Walls," in the 2014 NYC Building Code.

D. Coordinate wall sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.3 WOOD SHEATHING INSTALLATION

A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:

1. Subflooring:

a. Screw to cold-formed metal framing.
b. Space panels 1/8 inch apart at edges and ends.

3.4 GYPSUM SHEATHING INSTALLATION

A. Comply with GA-253 and with manufacturer's written instructions.

1. Fasten gypsum sheathing to cold-formed metal framing with screws.
2. Install boards with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
3. Install boards with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

B. Apply fasteners so heads bear tightly against face of sheathing boards but do not cut into facing.

C. Vertical Installation: Install board vertical edges centered over studs. Abut ends and edges of each board with those of adjacent boards. Attach boards at perimeter and within field of board to each stud.

1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of boards.

3.5 SHEATHING JOINT-AND-PENETRATION TREATMENT

A. Seal sheathing joints according to sheathing manufacturer's written instructions.

B. Apply elastomeric sealant to joints and fasteners and trowel flat. Apply sufficient quantity of sealant to completely cover joints and fasteners after troweling. Seal other penetrations and openings.

C. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing board joints and apply and trowel silicone emulsion sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

END OF SECTION 06 16 00

SECTION 06 41 16 –PLASTIC LAMINATE CLAD ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Plastic-laminate-clad architectural cabinets.
2. Cabinet hardware and accessories.
3. Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-clad architectural cabinets that are not concealed within other construction.

1.3 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to support loads imposed by installed and fully loaded cabinets.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 "Submittal Procedures."

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.

B. Sustainable Design Submittals:

1. Environmental Product Declaration (EPD): For each product.

2. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.
3. Laboratory Test Reports: For composite wood products, indicating compliance with requirements for low-emitting materials.

C. Shop Drawings:

1. Include plans, elevations, sections, and attachment details.
2. Show large-scale details.
3. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
4. Show locations and sizes of cutouts and holes for items installed in plastic-laminate architectural cabinets.

D. Samples: For each exposed product and for each color and texture specified, in manufacturer's or manufacturer's standard size.

1. 12 in by 12 for panel products.

1.7 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of product. inclusive if the following:

1. Composite wood products.
2. High-pressure decorative laminate.
3. Adhesives.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 "Quality Requirements."

B. Manufacturer's Qualifications: Employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

C. Installer Qualifications: Entity approved by manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver cabinets until painting and similar finish operations that might damage architectural cabinets have been completed in installation areas. Store cabinets in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.10 FIELD CONDITIONS

A. Environmental Limitations with Humidity Control: Do not deliver or install cabinets until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during the remainder of the construction period.

B. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1. Locate concealed framing, blocking, and reinforcements that support cabinets before being enclosed/concealed by construction, and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

A. Quality Standard: Unless otherwise indicated, comply with the Architectural Woodwork Standards for grades of cabinets indicated for construction, finishes, installation, and other requirements.

1. The Contract Documents may contain requirements that are more stringent than the referenced quality standard. Comply with requirements of Contract Documents in addition to those of the referenced quality standard.

B. Architectural Woodwork Standards Grade: Premium.

C. Type of Construction: Frameless.

D. Door and Drawer-Front Style: Flush overlay.

1. Reveal Dimension: As indicated.

E. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by quality standard.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Formica Corporation.
b. Abet Laminati Inc.
c. Wilsonart LLC.
d. Or approved equal.

F. Laminate Cladding for Exposed Surfaces:

1. Horizontal Surfaces: Grade HGS.

2. Vertical Surfaces: Grade VGS.
3. Edges: Grade VGS edge banding, 3.0 mm thick, matching laminate in color, pattern, and finish.

G. Materials for Semiexposed Surfaces:

1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, NEMA LD 3, Grade CLS.

   a. Edges of Plastic-Laminate Shelves: PVC edge banding, 3.0 mm thick, matching laminate in color, pattern, and finish.
   b. For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, NEMA LD 3, Grade CLS.

2. Drawer Sides and Backs: Solid-hardwood lumber.
3. Drawer Bottoms: Hardwood plywood.

H. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: High-pressure decorative laminate, NEMA LD 3, Grade BKL.

I. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.

1. Join sub-fronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners or glued dovetail joints.

2.2 WOOD MATERIALS

A. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.

1. "Composite Wood Products" Subparagraph below applies to ASHRAE 189.1.
2. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 130.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. Fire-Retardant-Treated Materials, General: Unless otherwise indicated, use materials that are acceptable to the New York City Department of Buildings and with fire-test-response characteristics specified as determined by testing identical products in accordance with test method indicated by a qualified testing agency.

1. Use treated materials that comply with requirements of referenced quality standard. Do not use materials that are warped, discolored, or otherwise defective.
2. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.

3. Identify fire-retardant-treated materials with appropriate classification marking of qualified testing agency in the form of removable paper label or imprint on surfaces that will be concealed from view after installation.

B. Fire-Retardant Fiberboard: MDF panels complying with ANSI A208.2, made from softwood fibers, synthetic resins, and fire-retardant chemicals mixed together at time of panel manufacture to achieve flame-spread index of 25 or less and smoke-developed index of 200 or less in accordance with ASTM E84.

2.4 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets.

B. Hinges in "Frameless Concealed Hinges (European Type)"

C. Edge Pulls: ANSI/BHMA A156.9, B02011.

1. Basis of Design Product: Subject to compliance with requirements, provide model VP36573G10, 3 inch satin nickel edge pulls as manufactured by Amerock, or a comparable product by one of the following:

a. Classic Brass Cabinet Hardware.
b. Emtek Hardware.
c. Or approved equal.

D. Back-Mounted Pulls: ANSI/BHMA A156.9, B02011.

E. Catches: Roller catches, ANSI/BHMA A156.9, B03071 Ball friction catches, ANSI/BHMA A156.9, B03013.

F. Adjustable Shelf Standards and Supports: ANSI/BHMA A156.9, B04102; with shelf brackets, B04112.

G. Drawer Slides: ANSI/BHMA A156.9.

1. Heavy-Duty (Grade 1HD-100 and Grade 1HD-200): Side mount.

a. Type: Full overtravel extension.
b. Material: Aluminum or Stainless steel slides.
c. Motion Feature: Push to open Soft close dampener.

H. Door and Drawer Silencers: ANSI/BHMA A156.16, L03011.

I. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with ANSI/BHMA A156.18 for ANSI/BHMA finish number indicated.

1. Satin Stainless Steel: ANSI/BHMA 630.

J. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in ANSI/BHMA A156.9.

2.5 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated softwood lumber, kiln-dried to less than 15 percent moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

C. Adhesives: Use adhesives that meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

D. Adhesive for Bonding Plastic Laminate: Unpigmented contact cement Contact cement Resorcinol.

1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

2.6 FABRICATION

A. Fabricate architectural cabinets to dimensions, profiles, and details indicated.

B. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

1. Trial fit assemblies at manufacturer's shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.

C. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Before installation, condition cabinets to humidity conditions in installation areas for not less than 72 hours.

3.3 INSTALLATION

A. Architectural Woodwork Standards Grade: Install cabinets to comply with quality standard grade of item to be installed.

B. Assemble cabinets and complete fabrication at Project site to extent that it was not completed in the shop.

C. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with wafer-head cabinet installation screws.

D. Install cabinets level, plumb, and true in line to a tolerance of 1/8 inch in 96 inches3 mm in 2400 mm using concealed shims.

1. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
2. Install cabinets without distortion so doors and drawers fit openings and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
3. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches (400 mm) o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.

3.4 ADJUSTING AND CLEANING

A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects. Where not possible to repair, replace architectural cabinets. Adjust joinery for uniform appearance.

B. Clean, lubricate, and adjust hardware.

C. Clean cabinets on exposed and semiexposed surfaces.

END OF SECTION 06 41 16

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 06 61 16 –SOLID SURFACING FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Solid surface countertops.
2. Solid surface reception desk and shelving.
3. Cabinet hardware and accessories.
4. Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-clad architectural cabinets that are not concealed within other construction.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For countertop materials and sinks.

B. Sustainable Design Submittals:

1. Product Data: For adhesives, indicating VOC content.
2. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.
3. Product Data: For composite wood products, indicating compliance with requirements for formaldehyde emissions

C. Shop Drawings: Provide shop drawings for all items identified in the above Article.

1. Show locations and details of joints.
2. Show direction of directional pattern, if any.
3. All details to be provided at a minimum scale of three inches equals one foot.

D. Samples for Initial Selection: For each type of material exposed to view.

E. Samples for Verification:

1. Provide 6 inch square samples of each type and color of solid surfacing.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For solid surface material countertops and integral sinks to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 "Quality Requirements."

B. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate countertops similar to that required for this Project, and whose products have a record of successful in-service performance.

C. Installer Qualifications: Fabricator of solid surfacing fabrications.

1.8 FIELD CONDITIONS

A. Environmental Limitations with Humidity Control: Do not deliver or install cabinets until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during the remainder of the construction period.

B. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1. Locate concealed framing, blocking, and reinforcements that support cabinets before being enclosed/concealed by construction and indicate measurements on Shop Drawings.

1.9 COORDINATION

A. Coordinate locations of utilities that will penetrate countertops or backsplashes.

PART 2 - PRODUCTS

2.1 SOLID SURFACE MATERIALS

A. Solid Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1.

1. Product: Subject to compliance with requirements, provide one of the following:

a. Corian; DuPont.

b. KRION; Porcelanosa.
c. Solid Surfacing; Wilsonart.
d. Or approved equal.

2. Colors and Patterns: The Commissioner reserves the right to revise colors during the submittal process and replace a color with another color in the same price group at no additional charge.

a. All solid surfacing will be selected from midlevel price group as approved by the Commissioner.

B. Marine Grade Plywood Subtop: Provide marine grade plywood panels with grade designation, APA B-B MARINE in 3/4-inch thickness.

2.2 COUNTER FABRICATION

A. Fabricate counters according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."

1. Grade: Premium.

B. Configuration: As indicated on the Drawings. Thermoform countertops where indicated or required.

C. Countertops: 3/4-inch- thick, solid surface material with front edge built up with same material, unless otherwise indicated.

D. Backsplashes and Sidesplashes: 3/4-inch thick, solid surface material unless otherwise indicated.

E. Fabricate tops with shop-applied edges, aprons, sidesplashes and backsplashes unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.

F. Cutouts and Holes:

1. Undercounter Fixtures: Make cutouts for fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.

a. Provide vertical edges, slightly eased at juncture of cutout edges with top and bottom surfaces of countertop and projecting 3/16 inch into fixture opening.
b. Provide vertical edges, rounded to 3/8-inch radius at juncture of cutout edges with top surface of countertop, slightly eased at bottom, and projecting 3/16 inch into fixture opening.
c. Provide 3/4-inch full bullnose edges projecting 3/8 inch into fixture opening.

2. Counter-Mounted Plumbing Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.

3. Fittings: Drill countertops in shop for plumbing fittings, undercounter soap dispensers, and similar items.

2.3 INSTALLATION MATERIALS

A. Adhesive: Product recommended by solid surface material manufacturer.

1. VOC Content: Refer to DDC General Conditions Section 018113.04 Sustainable Design Requirements for LEED v4 Buildings for VOC Requirements."
2. Adhesive must comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. Sealant for Countertops: Comply with applicable requirements in Section 07 92 00 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates to receive solid surface material countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Install countertops level to a tolerance of 1/8 inch in 8 feet, 1/4 inch maximum. Do not exceed 1/64-inch difference between planes of adjacent units.

B. Fasten subtops and sinks to cabinets by screwing through subtops or lavatories into cornerblocks of base cabinets. Shim as needed to align subtops and lavatories in a level plane.

C. Secure countertops to subtops with adhesive according to solid surface material manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

D. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.

1. Install metal splines in kerfs in countertop edges at joints where indicated. Fill kerfs with adhesive before inserting splines and remove excess immediately after adjoining units are drawn into position.
2. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.

E. Install aprons to backing and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Fasten by screwing through backing. Predrill holes for screws as recommended by manufacturer.

F. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.

END OF SECTION 06 61 16

THIS PAGE LEFT INTENTIONALLY BLANK

SECTION 07 11 13 – BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Dampproofing at exterior foundation walls and concealed areas of exposed landscape walls, as specified and as shown on the Drawings.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's technical data, application instructions, and recommendations for dampproofing materials. Include data substantiating that materials comply with requirements.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. General: Obtain primary materials from one manufacturer. Provide secondary materials only as recommended by manufacturer of primary materials.

C. Installer Qualifications: A firm which has specialized for not less than three years in installation of dampproofing required and which is acceptable to manufacturer of primary materials.

1.6 JOB CONDITIONS

A. Substrate: Proceed with dampproofing work only after substrate construction and penetrating work have been completed.

B. Weather: Proceed with dampproofing work only when existing and forecasted weather conditions will permit work to be performed in accordance with manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 BITUMINOUS DAMPPROOFING MATERIALS

A. General: Provide bituminous dampproofing materials which comply with the following requirements or provide other similar products which are certified in writing by manufacturer of primary dampproofing materials to be superior in performance for application indicated.

1. Dampproofing is a single component, rubber reinforced asphalt that forms a highly elastomeric waterproof coating when applied according to the manufacturer's instructions meeting ASTM D 4586, Type I; ASTM D 4479, Type I; ASTM D 3409.

2. Basis of Design: subject to compliance with the requirements, provide 229AR Elastomeric by Karnak or comparable product by one of the following:
   a. BASF Construction Chemicals - Building Systems; Sonneborn Brand Products.
   b. Henry Company.
   c. Meadows, W. R., Inc.
   d. Karnak.
   e. Or approved equal.

2.2 MISCELLANEOUS MATERIALS

A. Protection Board: Rigid insulation as specified in Section 07 21 00 “Thermal Insulation.”

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSPECTION

A. General: Examine substrate and conditions under which bituminous dampproofing work is to be performed. Proceed with work after unsatisfactory conditions have been corrected.

B. Pre-Installation Conference: Conduct a conference at the Project site as follows:

1. Before installing dampproofing system, but following acceptance of required submittals, meet with Commissioner, Contractor, and other entities whose Work relies upon, interfaces with, or is in direct contact with the specified dampproofing.
2. Review requirements for dampproofing, including surface preparation specified under other Sections, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, inspection and testing procedures, and protection and repairs.
3. Notify participants at least 7 days before conference.

3.3 PREPARATION

A. Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.

B. Clean substrates of projections and substances detrimental to the dampproofing work; fill voids, seal joints, and remove bond breakers if any, as recommended in writing by prime material manufacturer.

C. Apply patching compound to patch and fill tie holes, honeycombs, reveals, and other imperfections; cover with asphalt-coated glass fabric if required by the manufacturer.

3.4 INSTALLATION

A. General: Comply with manufacturer's instructions, except where Project conditions require extra precautions to ensure satisfactory installation of work.

B. Bituminous Dampproofing Installation: Apply dampproofing to below grade surfaces of exterior walls, where space of any kind is enclosed on opposite side.

1. Reinforcement: At changes in plane or where otherwise shown as "Reinforced", install lapped course of glass fiber mat in first coat of dampproofing compound before it thickens.
2. Bituminous Cant Strips: Install 2 by 2 inch cant strip of bituminous grout at base of vertical dampproofing at footings.
3. Apply dampproofing from finished grade to top of footing, over top of footing and down minimum of 6 inches over outside of footing. Extend 12 inches onto intersecting walls and footings but do not apply on surfaces which will remain exposed.

3.5 APPLICATION, GENERAL

A. Comply with manufacturer's written instructions for dampproofing application, cure time between coats, and drying time before backfilling unless more stringent requirements are indicated.

1. Apply dampproofing to provide continuous plane of protection.
2. Apply additional coats if recommended in writing by manufacturer or to achieve a smooth surface and uninterrupted coverage.

B. Where dampproofing footings and foundation walls, apply from finished-grade line to top of footing; extend over top of footing and down a minimum of 6 inches over outside face of footing.

1. Extend dampproofing 12 inches onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.
2. Install flashings and corner protection stripping at internal and external corners, changes in plane, construction joints, cracks, and where shown as "reinforced," by embedding an

8-inch-wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat for embedding fabric is in addition to other coats required.

3.6 CLEANING

A. Remove fall-out, spilled materials, surface contaminants and other defacements resulting from the application of the dampproofing systems specified.

3.7 PROTECTION

A. Protect exterior, below-grade dampproofing membrane from damage until backfill is completed. Remove overspray and spilled materials from surfaces not intended to receive dampproofing.

END OF SECTION 07 11 13

SECTION 07 13 26 – SELF ADHERING SHEET WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Modified bituminous sheet waterproofing.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review waterproofing requirements including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.5 SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
2. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.

B. Sustainable Design Submittals:

1. Environmental Product Declaration (EPD): For each product.

C. Shop Drawings: Show locations and extent of waterproofing and details of substrate joints and cracks, expansion joints, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

D. Samples: For each exposed product and for each color and texture specified, including the following products:

1. 8-by-8-inch square of waterproofing and flashing sheet.

E. Qualification Data: For Installer.

F. Field quality-control reports.

G. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.

C. Mockups: Build mockups to verify selections made under Sample submittals and to set quality standards for installation.

1. Build for each typical waterproofing installation including accessories to demonstrate surface preparation, crack and joint treatments, inside and outside corner treatments, and protection.

a. Size: 100 sq. ft. in area.
b. Description: Each type of wall installation.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Commissioner specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended in writing by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.

1. Do not apply waterproofing in snow, rain, fog, or mist.

B. Maintain adequate ventilation during preparation and application of waterproofing materials.

1.8 WARRANTY/GUARANTY

A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

B. Contractor's Guaranty: Special guaranty, signed by Installer, covering Work of this Section, for warranty period of two years from the date of Substantial Completion.

1. Guaranty includes removing and reinstalling insulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Waterproofing System: Obtain waterproofing materials and protection course from single source from single manufacturer.

2.2 MODIFIED BITUMINOUS SHEET WATERPROOFING

A. Modified Bituminous Sheet: Minimum 60-mil nominal thickness, self-adhering sheet consisting of 56 mils of rubberized asphalt laminated on one side to a 4-mil-thick, polyethylene-film reinforcement, and with release liner on adhesive side; formulated for application with primer or surface conditioner that complies with VOC limits of US EPA.

1. Basis-of-Design Product: Subject to compliance with requirements, provide GCP Applied Technologies Inc. (formerly Grace Construction Products); Bituthene 4000 or a comparable product by one of the following:

a. Carlisle Coatings & Waterproofing Inc.
b. Henry Company.
c. Or approved equal.

2. Physical Properties:

a. Tensile Strength, Membrane: 250 psi minimum; ASTM D 412, Die C, modified.
b. Ultimate Elongation: 300 percent minimum; ASTM D 412, Die C, modified.
c. Low-Temperature Flexibility: Pass at minus 20 deg F; ASTM D 1970/D 1970M.
d. Crack Cycling: Unaffected after 100 cycles of 1/8-inch movement; ASTM C 836/C 836M.
e. Puncture Resistance: 40 lbf minimum; ASTM E 154/E 154M.
f. Water Absorption: 0.2 percent weight-gain maximum after 48-hour immersion at 70 deg F; ASTM D 570.
g. Water Vapor Permeance: 0.05 perm maximum; ASTM E 96/E 96M, Water Method.
h. Hydrostatic-Head Resistance: 200 feet minimum; ASTM D 5385.

3. Sheet Strips: Self-adhering, rubberized-asphalt strips of same material and thickness as sheet waterproofing.

2.3 AUXILIARY MATERIALS

A. Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.

1. Furnish liquid-type auxiliary materials that comply with VOC limits of the US EPAn.

B. Surface Conditioner: Liquid, waterborne surface conditioner recommended for substrate by sheet-waterproofing material manufacturer.

C. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.

D. Substrate Patching Membrane: Low-viscosity, two-component, modified asphalt coating.

E. Metal Termination Bars: Aluminum bars, approximately 1 by 1/8 inch, predrilled at 9-inch centers.

F. Protection Course: ASTM D 6506, semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners and as follows:

1. Thickness: Nominal 1/8 inch for vertical applications; 1/4 inch elsewhere.
2. Adhesive: Rubber-based solvent type recommended by waterproofing manufacturer for protection course type.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of waterproofing.

1. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.
2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
3. Verify that compacted subgrade is dry, smooth, sound, and ready to receive waterproofing sheet.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.

B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.

C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.

E. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.

1. Install sheet strips of width according to manufacturer's written instructions and center over treated construction and contraction joints and cracks exceeding a width of 1/16 inch.

F. Bridge expansion joints with overlapping sheet strips of widths according to manufacturer's written instructions.

1. Invert and loosely lay first sheet strip over center of joint. Firmly adhere second sheet strip to first and overlap to substrate.

G. Corners (Modified Bituminous Sheets): Prepare, prime, and treat inside and outside corners according to ASTM D 6135.

1. Install membrane strips centered over vertical inside corners. Install 3/4-inch fillets of liquid membrane on horizontal inside corners and as follows:

a. At footing-to-wall intersections, extend liquid membrane in each direction from corner or install membrane strip centered over corner.

H. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions according to ASTM D 6135.

3.4 MODIFIED BITUMINOUS SHEET-WATERPROOFING APPLICATION

A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions and per recommendations in ASTM D 6135.

B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.

C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch-minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure watertight installation.

1. When ambient and substrate temperatures range between 25 and 40 deg F, install self-adhering, modified bituminous sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F.

D. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.

E. Seal edges of sheet-waterproofing terminations with mastic.

F. Install sheet-waterproofing and auxiliary materials to tie into adjacent waterproofing.

G. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches beyond repaired areas in all directions.

H. Immediately install protection course with butted joints over waterproofing membrane.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Contractor will engage a qualified testing agency to perform tests.

B. Manufacturer's Field Service: Engage a site representative qualified by waterproofing membrane manufacturer to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components; and to furnish daily reports to Commissioner.

C. Waterproofing will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.6 PROTECTION, REPAIR, AND CLEANING

A. Do not permit foot or vehicular traffic on unprotected membrane.

B. Protect waterproofing from damage and wear during remainder of construction period.

C. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.

D. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

END OF SECTION 07 13 26

SECTION 07 16 16 - CRYSTALLINE WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract."

1.2 SUMMARY

A. Section Includes:

1. Crystalline waterproofing.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 "Submittal Procedures."

1.4 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 "Quality Requirements."

1.5 FIELD CONDITIONS

A. Weather Limitations: Proceed with application only when existing and forecasted weather conditions permit crystalline waterproofing to be performed according to manufacturer's written instructions.

B. Proceed with waterproofing work only after pipe sleeves, vents, curbs, inserts, drains, and other projections through the substrate to be waterproofed have been completed. Proceed only after substrate defects, including honeycombs, voids, and cracks, have been repaired to provide a sound substrate free of forming materials, including reveal inserts.

C. Ambient Conditions: Proceed with waterproofing work only if temperature is maintained at 40 deg F or above during work and cure period, and space is well ventilated and kept free of water.

PART 2 - PRODUCTS

2.1 WATERPROOFING MATERIALS

A. Crystalline Waterproofing: Prepackaged, colored proprietary blend of portland cement, specially treated sand, and active chemicals that, when mixed with water and applied, penetrates into concrete and concrete unit masonry and reacts chemically with the byproducts of cement hydration in the presence of water to develop crystalline growth within substrate capillaries to produce an impervious, dense, waterproof substrate; with properties complying with or exceeding the criteria specified below.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Aquafin, Inc.
   b. Kryton International, Inc.
   c. Xypex Chemical Corp.
   d. Or approved equal.

2. Water Permeability: Maximum when tested according to COE CRD-C 48.

2.2 ACCESSORY MATERIALS

A. Patching Compound: Factory-premixed cementitious repair mortar, crack filler, or sealant recommended by waterproofing manufacturer for filling and patching tie holes, honeycombs, reveals, and other imperfections; and compatible with substrate and other materials indicated.

B. Water: Potable.

2.3 MIXES

A. Crystalline Waterproofing: Add prepackaged dry ingredients to water according to manufacturer's written instructions. Mix together with mechanical mixer or by hand to required consistency.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator present, for suitable conditions where waterproofing is to be applied.

B. Proceed with application only after unsatisfactory conditions have been corrected.

C. Notify Commissioner in writing of active leaks or defects that would affect system performance.

3.3 PREPARATION

A. Comply with manufacturer's written instructions.

B. Protect work of other trades from damage caused by cleaning, preparation, and application of waterproofing. Provide temporary enclosure to confine spraying operation and to ensure adequate ambient temperatures and ventilation conditions for application.

C. Do not allow waterproofing, patching, and plugging materials to enter reveals or annular spaces intended for resilient sealants or gaskets, such as joint spaces between pipes and pipe sleeves.

D. Stop active water leaks with plugging compound.

E. Repair damaged or unsatisfactory substrate with patching compound.

1. At holes and cracks 1/16 inch wide or larger in substrate, remove loosened chips and cut reveal with sides perpendicular to surface, not tapered, and minimum 1 inchdeep. Fill reveal with patching compound flush with surface.

F. Surface Preparation: Remove efflorescence, chalk, dust, dirt, mortar spatter, grease, oils, paint, curing compounds, and form-release agents to ensure that waterproofing bonds to surfaces.

1. Clean concrete surfaces according to ASTM D4258.
2. Concrete Joints: Clean reveals.

3.4 INSTALLATION

A. Comply with waterproofing manufacturer's written instructions for application and curing.
1. Saturate surface with water for several hours and maintain damp condition until applying waterproofing. Remove standing water.
2. Apply waterproofing to interior surfaces of pits and other area indicated.
3. Number of Coats: Number required for specified water permeability.
4. Application Method: Apply to ensure that each coat fills voids and is in full contact with substrate or previous coat.
5. Dampen surface between coats.

B. Final Coat Finish: Brushed or Spray textured.

C. Curing: Moist-cure waterproofing for three days immediately after final coat has set, followed by air drying, unless otherwise recommended in writing by manufacturer.

3.5 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed application of waterproofing.

B. Prepare test and inspection reports.

END OF SECTION 07 16 16

SECTION 07 21 00 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Extruded polystyrene foam-plastic board.
2. Polyisocyanurate foam-plastic board.
3. Glass- fiber blanket.
4. Mineral- wool blanket.
5. Installation accessories.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Product Data: For adhesives, indicating VOC content
2. Laboratory Test Reports: For insulation, indicating compliance with requirements for low-emitting materials.
3. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.

1.5 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each product, for tests performed by a qualified testing agency.

B. Evaluation Reports: For foam-plastic insulation, from ICC-ES.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. On-site Facade Mockups: Include as part of on-site facade mockup required by other sections, as indicated on the drawings, work specified in this section. All required submittals for the work specified in this section will be submitted by the Contractor and accepted by the Commissioner prior to the Contractor furnishing elements for the on-site facade mockup.

1. Provide each type of insulation installation in sizes, quantities, and configuration indicated on the drawings.
2. Incorporate full-scale details of the architectural features, approved finished and textures, brackets and attachment components required for installation.
3. Approval of on-site facade mockup does not constitute approval of deviations from the Contract Documents contained in the on-site facade mockup unless the Commissioner specifically approves such deviations in writing.
4. Maintain on-site facade mockup at the project site until directed to demolish and remove the on-site facade mockup by the Commissioner.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect foam-plastic board insulation as follows:

1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 FOAM-PLASTIC BOARD INSULATION

A. Extruded polystyrene boards in this article are also called "XPS boards." Roman numeral designators in ASTM C 578 are assigned in a fixed random sequence, and their numeric order does not reflect increasing strength or other characteristics.

B. Exterior wall insulation below grade at foundation walls, grade beams, and exposed edges of slabs on grade. Provide the following types as indiact6ed and required by project application:

1. Extruded Polystyrene Board, Type VI: ASTM C578, Type VI, 40-psi minimum compressive strength; maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E84.
2. Type VI, Drainage Panels, 40-psi minimum compressive strength; unfaced; maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E 84; fabricated with shiplap or channel edges and with one side having grooved drainage channels.

3. Minimum thermal resistance by nominal thickness, as determined using ASTM C518 at 75 degrees mean temperature: R-5 per inch.

C. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Dow Chemical Company (The); STYROFOAM Brand insulation.
2. Owens Corning.
3. Johns Manville.
4. Or approved equal.

2.2 POLYISOCYANURATE FOAM-PLASTIC BOARD INSULATION

A. Exterior Insulation above grade- Polyisocyanurate Board, Glass-Fiber-Mat Faced: ASTM C 1289, glass-fiber-mat faced, Type II, Class 2.

1. Minimum thermal resistance by nominal thickness, as determined using ASTM C518 at 75 degrees mean temperature, for thickness as follows:

a. 2 inch - R-12.1.
b. 3 inch - R-18.5.
c. 4 inch - R-25.0.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Dow Chemical Company (The); STYROFOAM Brand insulation.
2. Owens Corning.
3. Johns Manville.
4. Or approved equal.

2.3 UNFACED SEMI-RIGID INSULATION

A. Unfaced, Faced Semi-Rigid Insulation Board: ASTM C 612, Type 4B non-combustible, lightweight and water repellent, for use in exterior wall applications, with maximum flame-spread and smoke- developed indexes of 0 and 5, respectively.

1. Nominal density of 4.3 lb/cu. ft., thermal resistivity of 4 deg F x h x sq. ft./Btu x in. at 75 deg F.
2. Thickness: As indicated on the Drawings, unless otherwise required to meet the State of New York Energy Code.

B. Basis of Design Product: Subject to compliance with requirements, provide “Cavityrock” as manufactured by Roxul, or comparable product by one of the following:

1. CertainTeed Corporation.
2. Johns Manville.
3. Or approved equal.

2.4 GLASS-FIBER BLANKET INSULATION

A. Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics. Minimum R-10.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. CertainTeed Corporation.
2. Johns Manville.
3. Owens Corning.
4. Or approved equal.

2.5 MINERAL-WOOL BLANKETS

A. Mineral-Wool Blanket, Unfaced: ASTM C665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E84; passing ASTM E136 for combustion characteristics. Minimum R-15.

B. Products: Subject to compliance with requirements, provide one of the following:

1. Johns Manville; a Berkshire Hathaway company; MinWool Sound Attenuation Fire Batt.
2. Rockwool International; AFB, AFB evo, or COMFORTBATT.
3. Thermafiber, Inc.; an Owens Corning company; FS-15 or SAFB (Sound Attenuation Fire Blankets).
4. Or approved equal.

2.6 INSULATION FASTENERS

A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position indicated with self-locking washer in place.

1. Products: Subject to compliance with requirements, provide products by one of the following:

a. AGM Industries, Inc.; Series T TACTOO Insul-Hangers.
b. Gemco; Spindle Type.
c. Gripnail Fastening Systems.
d. Or approved equal.

2. Plate: Perforated, galvanized carbon-steel sheet, 0.030-inch-thick by 2 inches square.
3. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation indicated.

B. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick galvanized-steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches square or in diameter.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ADO Products.
b. AGM Industries, Inc.
c. Gemco; Dome-Cap.
d. Or approved equal.

2. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in the following locations:

a. Provide capped washers to tops of spindles where foundation wall insulation is not covered by building materials and where indicated.

C. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

D. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

1. Products: Subject to compliance with requirements, provide one of the following:

a. AGM Industries, Inc.; TACTOO Adhesive.
b. Gemco; Tuff Bond Hanger Adhesive.
c. SIMPSON STRONG-TIE; Epoxy Anchor Adhesive.
d. Or approved equal.

2.7 ACCESSORIES

A. Faced Acoustic Insulation: Sole Source Manufacturer: Subject to compliance with requirements, provide acoustical insulation as indicated on the Drawings and as manufactured by C.E. Electronics – Acoustic Group. CQuiet Hydro Noise Shield: airborne sound barrier to walls and ceiling of elevator machine room as shown on the drawings, nominal thickness 2”.

1. No substitutions permitted.

B. Pipe Noise Shield: Sole Source Manufacturer: Subject to compliance with requirements, provide pipe noise shields, as manufactured by C.E. Electronics – Acoustics Group: CQuiet Pipe Noise Shield: Hydraulic pipe airborne sound barrier wrap, nominal thickness 1”.

1. No substitutions permitted.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Clean substrates of substances that are harmful to insulation or that interfere with insulation attachment.

3.3 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.4 INSTALLATION OF FOUNDATION WALL INSULATION

A. Butt panels together for tight fit.

B. Anchor Installation: Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:

1. Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application.
2. Apply insulation standoffs to each spindle to create cavity width indicated on Drawings between concrete substrate and insulation.
3. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation.
4. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.

3.5 INSTALLATION OF WALL INSULATION

A. Install pads of adhesive spaced approximately 24 inches o.c. both ways on inside face and as recommended by manufacturer. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates.

1. Supplement adhesive attachment of insulation by securing boards with two-piece wall ties designed for this purpose and specified in Section 04 20 00 "Unit Masonry."

3.6 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Glass-Fiber Insulation: Install in cavities formed by framing members according to the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
4. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
5. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings and seal each continuous area of insulation to ensure airtight installation.

a. Exterior Walls: Set units with facing placed toward interior of construction.
b. Interior Walls: Set units with facing placed toward areas of high humidity.

C. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

3.7 INSTALLATION OF INSULATION FOR SOUND ATTENUATION

A. Where mineral fiber blankets are indicated for sound attenuation, install blanket insulation solid between framed spaces in thicknesses indicated.

3.8 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.

B. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00

SECTION 07 27 26 - FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Vapor- permeable fluid-applied air barriers.
2. Flashings
3. Flashing Primer
4. Sealant
5. Thru-wall Flashing
6. Installation accessories.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 COORDINATION

A. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review air-barrier requirements and installation, special details, mockups, air-leakage and bond testing, air-barrier protection, and work scheduling that covers air barriers.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Product Data: For coatings, indicating VOC content.
2. Laboratory Test Reports: For coatings, indicating compliance with requirements for low-emitting materials.

C. Shop Drawings: For air-barrier assemblies.

1. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.

1.7 INFORMATIONAL SUBMITTALS

A. Product certificates.

B. Product test reports.

C. Field quality-control reports.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Installer Qualifications: Installer must be properly trained by the manufacturer.

C. Mockups: Build mockups to set quality standards for materials and execution.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Air-Barrier Performance: Air-barrier assembly and seals with adjacent construction will be capable of performing as a continuous air barrier. Air-barrier assemblies will be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

B. Physical and Performance Properties:

1. Air Permeance: As indicated by manufacturers product designation; per ASTM E2178.
2. Vapor Permeance: As indicated by manufacturers product designation; per ASTM E96/E96M, Desiccant Method.
3. Elongation: As indicated by manufacturers product designation; per ASTM D412, Die C.
4. Adhesion to Substrate: As indicated by manufacturers product designation; when tested according to ASTM D4541.
5. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.2 HIGH-BUILD AIR BARRIERS, VAPOR PERMEABLE

A. High-Build, Vapor-Permeable Air Barrier: Synthetic polymer membrane with an installed dry film thickness, according to manufacturer's written instructions, of 35 mils or thicker over smooth, void-free substrate.

B. Product: Subject to compliance with requirements, provide one of the following:

1. GCP Applied Technologies Inc.; Perm-A-Barrier VP.
2. Henry Company; Air-Bloc 17MR.
3. Tremco Incorporated; ExoAir 230.
4. Or approved equal.

2.3 ACCESSORY MATERIALS

A. Requirement: Provide primers, transition strips, termination strips, joint reinforcing fabric and strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by air-barrier manufacturer to produce a complete air-barrier assembly and that are compatible with primary air-barrier material and adjacent construction to which they may seal.

B. Primer: Liquid primer recommended for substrate by air-barrier material manufacturer.

C. Preformed Silicone Extrusion: Manufacturer's standard system consisting of cured low-modulus silicone extrusion, sized to fit opening widths, with a single-component, neutral-curing, Class 100/50 (low-modulus) silicone sealant for bonding extrusions to substrates.

1. Comply with Section 07 92 00 - Joint Sealants.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

1. Verify that substrate is sound and free of oil, grease, dirt, excess mortar, or other contaminants.
2. Verify that substrate has cured and aged for minimum time recommended in writing by air-barrier manufacturer.
3. Verify that substrate is visibly dry and free of moisture.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 SURFACE PREPARATION

A. Clean, prepare, treat, fill, and seal substrate and joints and cracks in substrate according to manufacturer's written instructions and details. Provide clean, dust-free, and dry substrate for air-barrier application.

B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.

C. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching material.

D. Remove excess mortar from masonry ties, shelf angles, and other obstructions.

E. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.

3.4 INSTALLATION

A. Install materials according to air-barrier manufacturer's written instructions and details to form a seal with adjacent construction and ensure continuity of air and water barrier.

1. Install transition strip on roofing membrane or base flashing so that a minimum of 3 inches of coverage is achieved over each substrate.
2. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
3. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.

B. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.

C. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames, with not less than 1 inch of full contact.

D. Restore punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches beyond restored areas in strip direction.

E. Apply continuous unbroken air-barrier material to substrates according to the following thickness. Apply air-barrier material in full contact around protrusions such as masonry ties.

F. Do not cover air barrier until it has been tested and inspected by testing agency.

G. Correct deficiencies in or remove air barrier that does not comply with requirements; restore substrates and reapply air-barrier components.

3.5 FIELD QUALITY CONTROL

A. Refer to Sections 01 91 19.43 “Exterior Enclosure Commissioning" and 01 91 15 "General

Commissioning Requirements For Building Enclosure" for testing procedures and requirements.

B. Tests: As determined by testing agency from among the following tests:

1. Air-barrier dry film thickness.
2. Air-Leakage-Location Testing: Air-barrier assemblies will be tested for evidence of air leakage according to ASTM E1186, chamber pressurization or depressurization with smoke tracers.
3. Air-Leakage-Volume Testing: Air-barrier assemblies will be tested for air-leakage rate according to ASTM E783 or ASTM E2357.
4. Adhesion Testing: Air-barrier assemblies will be tested for required adhesion to substrate according to ASTM D4541 for each 600 sq. ft. of installed air barrier or part thereof.

C. Air barriers will be considered defective if they do not pass tests and inspections.

1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
2. Remove and replace deficient air-barrier components for retesting as specified above.

D. Restore damage to air barriers caused by testing; follow manufacturer's written instructions.

E. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.

B. Remove masking materials after installation.

END OF SECTION 07 27 26

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 07 31 26 - SLATE SHINGLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. New slate roof shingles and accessories, required for alterations to existing roofing.
2. Restoration of existing slate roofing systems, as indicated.
3. Felts, fasteners, caulkings, flashings, membranes and other accessories.
4. Stainless steel cricket.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 "Submittal Procedures."

1.4 SUBMITTALS

A. Product Data: Submit slate fabricators specifications, installation instructions and general recommendations for roofing applications. Include certification or other data substantiating that materials comply with specified requirements.

B. Sustainable Design Submittals:

1. Environmental Product Declaration (EPD): For each product.

C. Samples: Submit samples of each color of slate specified and of roofing cement.

D. Shop Drawings: Submit layout drawings showing graduations, courses and color distribution. Include details of hip and valley conditions and of open slating.

1. Clearly indicate the "salvaged" roofing slates and accessories required for the proposed roofing work.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 "Quality Requirements."

B. Installer: A firm with three years of prior successful experience with installation of slate roofing of the type required for this Project.

C. Standards: Except as otherwise shown or specified, comply with the applicable recommendations and details of the National Slate Association and of "Slate Roofs" published by Quarry Slate Industries, Inc.

D. Source Limitations for Slate: Obtain each variety of slate from one source with resources to provide materials of consistent quality in appearance and physical properties

E. Mock-Up: Prior to the commencement of the slate roofing, and slate roofing repairs, prepare a mock-up of each type of slate installation (including proposed restoration). Incorporate materials and installation methods which are identical to Project requirements. Install mock-up at roof area location shown on the Drawings or as directed by the Commissioner. Retain accepted mock-up as standard of quality for acceptance of completed slate roofing work. Accepted mock-up may be incorporated as part of the Work.

F. Preapplication Roofing Conference: Approximately 2 weeks prior to scheduled commencement of roofing installation and associated work, meet at Project site with Installer, installer of each component of associated work, installers of deck or substrate construction to receive roofing work, installers of rooftop units and other work in and around roofing that must precede or follow roofing work-including mechanical work, Commissioner, roofing manufacturer's representative, and other representatives directly concerned with work performance.

1. Review foreseeable methods and procedures related to roofing work, including, but not necessarily limited to, the following:

   a. Tour representative areas of roofing substrates (decks), inspect and discuss condition of substrate, roof drains, curbs, penetrations, and other preparatory work performed by other trades.
   b. Review roofing system requirements: drawings, specifications, and other contract documents.
   c. Review required submittals, both complete and incomplete.
   d. Review and finalize construction schedule related to roofing work and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   e. Review required inspection, testing, certifying, and material use accounting procedures.
   f. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing, if it is not a mandatory requirement.

2. Record (Contractor) discussions of conference, including decisions and agreements or disagreements reached, and furnish a copy for each attendee. If substantial disagreements exist at the conclusion of the conference, determine how disagreements will be resolved and set a date for reconvening the conference.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver slate shingles to Project site and store as close as possible to the point of installation to minimize damage while handling.

B. Store and handle roofing materials to prevent breakage and ensure dryness. Store in a dry, well-ventilated, weathertight place. Store rolls of felt and other sheet materials on end on pallets or another raised surface.

C. Do not leave unused felts on roof overnight or when roofing work is not in progress unless protected from weather or other moisture sources.

D. Handle and store materials and equipment in a manner to avoid significant or permanent deflection of deck.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with work only when existing and forecasted weather conditions permit work to be installed according to manufacturer's written instructions and warranty requirements, and when substrate is completely dry.

1.8 WARRANTY

A. Special Project Warranty: Submit a written warranty, executed by the manufacturer, agreeing to repair or replace slate shingles that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, deformation or deterioration of shingles beyond normal weathering.

1. Warranty period is 20 years after date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Buckingham-Virginia Slate Corp.
2. North American Slate Co., Inc.
3. Vermont Structural Slate Company, Fair Haven, VT.
4. Or approved equal.

2.2 MATERIALS

A. Slate: (FS SS-S-451) ASTM C 406, Grade S1, unfading (non-fading), color mix and sizes as specified; rough texture with two machine punched holes at top of each unit, and as follows:

1. Color: Grey, to match existing.
2. Size: +/- 13” x 20” to match existing.
3. Exposure: +/- 10” x 20” to match existing.
4. Headlap: +/- 3” to match existing.
5. Thickness: +/- 3/8” varies, to match existing.

B. Roofing Felt: ASTM D 226, 30 lb. Type II, asphalt saturated organic roofing felt.

C. Perimeter Underlayment: Polyethylene-sheet-backed rubberized asphalt membrane, 40 mils thick. Provide primer when recommended by underlayment manufacturer.

1. Products: Subject to compliance with requirements, provide one of the following:

a. "Bituthene Ice & Water Shield"; W.R. Grace & Co.
b. "Mirafi Water and Ice Protection"; Nicolon/Mirafi.
c. "Polyguard Deck Guard"; Polyguard Products, Inc.
d. Or approved equal.

D. Elastic Cement: Waterproof elastic slaters cement of type recommended by cement manufacturer and roofing installer for uses required, colored to match general color of slate as closely as possible.

E. Nails: Large head slaters' solid copper nails of sufficient length to adequately penetrate nailing substrate, in accordance with the National Slate Association and "Slate Roofs" publication previously referenced.

F. Cricket: Subject to compliance with requirements, provide stainless steel Type 304 cricket with standing seams and all required terminations and flashing.

2.3 SLATE SHINGLE FABRICATION, GENERAL

A. General: Production and fabrication of slate roofing tiles will be controlled in such a way as to minimize or eliminate, to the greatest extent possible, imperfections and flaws in the materials prior to shipment.

B. The following physical requirements will be enforced to ensure a long lasting, premium quality installation.

1. Slate shingles will be fabricated ("on the grain") with the direction of the grain parallel to the long dimension of the shingle. Cross grain slates are not permitted.
2. Broken corners on the exposed edges and ends of the slate shingle are not permitted.

a. Broken corners on the concealed portions of the slate shingles will be permissible; providing corner breakage is limited to not more than one inch in length.

3. Shingle curvature will not be permitted.
4. Slate shingles will be free from ribbons, cracks, quartz veins and iron pyrites.
5. Fabrication tolerances of slate shingles will not exceed 1/8 inch + in any direction.

a. Slate shingles which are less than 3/16 inch thick in any location will not be permitted.

6. Soundness: Slate shingles will be manufactured of solid, sound and stable materials; slate should "ring" like china when tapped with knuckles.
7. Slate shingles will be fabricated with "pre-drilled" fastener holes; field punching or drilling will not be permitted except where slates are cut in the field.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Installer will inspect substrate for slate roofing work and the conditions under which the work is to be installed and notify the Contractor of conditions detrimental to the proper installation of slate roofing. Do not start installation until unsatisfactory conditions have been corrected.

B. Install slate roofing according to the applicable instructions of the National Slate Association for the type of roofing required and as specified herein.

C. Ice-Protection Underlayment: In addition to felt underlayment, install continuous strip of ice-protection underlayment, consisting of an additional strip of No. 30 roofing felt (to form a two-ply membrane) along eaves to a point at least 24 inches beyond inside face of outside wall. Set in a continuous bed of mastic and secure with roofing nails at 6 inches o.c. along top edges. Provide minimum 2 inch side laps, sealed with mastic.

D. Sloped Roofs:

1. Perimeter Underlayment: Apply minimum 24 inch wide layer of perimeter underlayment at entire perimeter of surface to receive slate roofing at projections through roof, ridges, hips, valleys, low slope areas, rakes and edges. Extend perimeter underlayment at edges a minimum of 24 inches inside exterior wall line.

   a. At all eaves apply minimum 36 inch wide layer of perimeter underlayment, and at all other perimeter surface to receive slate shingles.

2. Cover substrate with roofing felt laid in horizontal layers with joints lapped toward eaves and at ends at least 2 inch and secured along laps and at ends to hold felts in place. Lap felts over hips and ridges 12 inch to form double thickness.
3. Cover entire surfaces as shown to comply with color mix and exposure schedule specified, secured with nails as specified (2 per shingle as indicated).
4. Provide slate starter course constructed of two slates, installed with back surfaces facing one another to prevent "wicking" action of water; refer to Drawings for details.
5. Slates will project 2 inches at the eaves and 1 inch at all gable ends as directed and will be laid in horizontal courses with a 3 inch headlap, and each course will break joints with the preceding one. Slates at the eaves or cornice line will be doubled and canted so that the succeeding course will have a flat contact.
6. Hips: All hips will be mitered. Hip slates will be accurately cut to form tight alternating lap joints, interwoven with 16 oz. copper and the joints will be filled with elastic cement. Nails will be concealed by succeeding hip slates.
7. Ridges: All ridges will be fabricated with lead coated copper ridge caps, as indicated. Refer to Section - Flashing and Sheet Metal.
8. Slates overlapping sheet metal work will have the nails placed to avoid puncturing the sheet metal. Exposed nails will not be permitted, flashings will cover nails.

9. Cover are exposed nail heads with elastic cement. Hip slates and ridge slates will be laid in elastic cement spread thickly over unexposed surface of under course of slate.
10. Install cricket in compliance with manufacturer's written instructions, and approved Shop Drawings.

3.3 SLATE ROOFING RESTORATION

A. General: Installer will inspect existing slate roof assemblies requiring restoration and other remedial work/conditions under which the restoration and modification work is to be executed. Installer will immediately notify the Contractor of conditions detrimental to the proper repair of existing slate roofing assemblies. Do not commence roof repair work until unsatisfactory conditions have been corrected.

B. Execute the roofing restoration in strict accordance with the recommendations of the National Slate Association for the type of roofing restoration specified herein.

C. Restore broken slates by removing slate, cutting the nails. Insert new slate and nail through vertical joint in overlying slate, 5 inches from the head of the slate or 2 inches below the tail of the second course of the slate above.

1. Insert a 3 inch x 8 inch section, of not less than 16 oz copper, under the course above. Extend copper sheet a few inches under the succeeding course. Fold copper and open and use roofing cement to ensure attachment. Remove roofing cement from exposed area.
2. Restored slate roofing assemblies will match the existing slate assemblies in shingle exposure and other aesthetic properties. Restoration is subject to the acceptance of the Commissioner.

3.4 ADJUST AND CLEAN

A. Replace broken, damaged or otherwise defective slate shingles and accessories; replacements will result in repairs with performances matching the newly installed roof and show no evidence of repair.

B. Final Acceptance: Upon completion of slate roofing Work, all slates must be sound, whole and clean. The slate roofing system must be left watertight.

C. Debris: Remove and legally discard all waste materials resulting from slate roofing installation.

END OF SECTION 07 32 10

SECTION 07 42 13.13 – FORMED METAL WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Concealed-fastener, lap-seam metal wall panels (Types M1, M2, an M2A).

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Commissioner, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
6. Review temporary protection requirements for metal panel assembly during and after installation.
7. Review of procedures for repair of metal panels damaged after installation.
8. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Sustainable Design Submittals:

1. Environmental Product Declaration (EPD): For each product.
2. Health Product Declaration: For each product.
3. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.

C. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

D. Samples for Initial Selection: For each type of metal panel indicated with factory-applied finishes.

1. Include Samples of trim and accessories involving color selection.

E. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below:

1. Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each product, for tests performed by a qualified testing agency.

C. Field quality-control reports.

D. Sample Warranties: For special warranties.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical metal panel assembly as shown on Drawings, including supports, attachments, and accessories.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Commissioner specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

E. Copper Panels: Wear gloves when handling to prevent fingerprints and soiling of surface.

1.10 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.11 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.12 WARRANTY

A. Product Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including rupturing, cracking, or puncturing.

b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: 20 years from date of Substantial Completion.

B. Finish Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E1592:

1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings.
3. Deflection Limits: For wind loads, no greater than 1/240 of the span.

B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E283 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft.

C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E331 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

E. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 CONCEALED-FASTENER, LAP-SEAM METAL WALL PANELS

A. Provide factory-formed metal panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.

B. Flush-Profile, Concealed-Fastener Metal Wall Panels (M1 and M2): Formed with vertical panel edges and intermediate stiffening ribs symmetrically spaced or a flat pan between panel edges; with flush joint between panels.

1. Basis-of-Design Product (M1): Subject to compliance with requirements, provide ATAS International, Inc.; Opaline OPF with 8 inch coverage, or comparable product by one of the following:

a. CENTRIA Architectural Systems.
b. IMETCO.
c. Or approved equal.

2. Basis-of-Design Product (M2 and M2A): Subject to compliance with requirements, provide ATAS International, Inc.; Opaline OPM or comparable product by one of the following:

a. CENTRIA Architectural Systems.
b. IMETCO.
c. Or approved equal.

C. Aluminum Sheet: Coil-coated sheet, ASTM B209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.

1. Thickness: 0.040 inch.
2. Surface: Smooth, flat finish.
3. Exterior Finish: Color anodized.
4. Color: M1: Zinc ll and M2: Matte Black or color as selected by Commissioner from manufacturer's full range.
5. Panel Coverage: 8 inches, unless otherwise indicated.
6. Panel Height: 1.125 inches unless otherwise shown.

2.3 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, G90 coating designation or ASTM A792/A792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

D. Panel Fasteners:

1. Fasteners: Manufacturer's standard type.

a. Metal-to-Metal Fasteners: Self-drilling, self-tapping screws.
b. Metal-to-Wood Fasteners: Self-tapping wood screws.
c. Carbon steel thread with organic long-life coating.
d. Exposed Fasteners: Type 304 stainless steel cap head.

2. Encapsulated EPDM Washer:

a. Baked-on, high-performance-compatible, chip-resistant finish to match panel color.

E. Panel Sealants: Provide sealant types recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Exposed Sealant: High-performance elastomeric, clear tri-polymer, as recommended by manufacturer.
2. Concealed Sealant: High-performance spacer cubes to prevent bottoming out of sealant when fasteners are installed with non-curing butyl tape.
3. Seam Sealant: Factory-applied, high-performance, high-solid, non-skinning, non-drying seam sealant formulated for roll forming application into concealed panel joints.

2.4 FABRICATION

A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

C. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions and recommendations that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

    a. Size: As recommended by metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Aluminum Panels and Accessories:

1. Exposed Anodized Finish:

    a. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.

a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

3.4 INSTALLATION

A. Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.

6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Aluminum Panels: Use aluminum or stainless steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Lap ribbed or fluted sheets one full rib. Apply panels and associated items true to line for neat and weathertight enclosure.
2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
5. Flash and seal panels with weather closures at perimeter of all openings.

E. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal wall panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

F. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not

be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.5 FIELD QUALITY CONTROL

A. Refer to Sections 01 91 19.43 “Exterior Enclosure Commissioning" and 01 91 15 "General Building Enclosure Requirements for Building Enclosure" for testing procedures and requirements.

B. Water-Spray Test: After installation, test area of assembly as directed by Commissioner for water penetration according to AAMA 501.2.

C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal wall panel installation, including accessories.

D. Remove and replace metal wall panels where tests and inspections indicate that they do not comply with specified requirements.

E. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

F. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 42 13.13

SECTION 07 42 13.16 –METAL PLATE WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Metal plate, rain screen, wall panels.
2. Metal plate wall panels, fascia, exterior and interior soffits, and trim.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Commissioner, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
6. Review temporary protection requirements for metal panel assembly during and after installation.
7. Review procedures for repair of metal panels damaged after installation.
8. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Sustainable Design Submittals:

1. Environmental Product Declaration: For each product.
2. Health Product Declaration: For each product.
3. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.

C. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment assembly, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage, at a scale of not less than 1-1/2 inches per 12 inches.

D. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

E. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each product, tests performed by a qualified testing agency.

C. Field quality-control reports.

D. Sample Warranties: For special warranties.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical metal panel assembly as shown on Drawings, including corner, soffits, supports, attachments, and accessories.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Commissioner specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

1.10 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.11 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.12 WARRANTY

A. Product Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including rupturing, cracking, or puncturing.
b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: 20 years from date of Substantial Completion.

B. Finish Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E1592:

1. Wind Loads: As calculated, but not less than 5 psf.
2. Other Design Loads: Calculated load for cladding 30 psf.
3. Deflection Limits: For wind loads, no greater than 1/240 of the span.

B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E283 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft.

C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E331 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METAL PLATE WALL PANELS (M3 and M4)

A. Metal Plate Wall Panels: Provide factory-formed, metal plate wall panels fabricated from single sheets of metal formed into profile for installation method indicated. Include attachment assembly components, panel stiffeners, and accessories required for weathertight system.

1. Basis of Design Product: Subject to compliance with requirements, provide AP2500RS as manufactured by Protean Construction Products, Inc., or comparable product by one of the following:

a. Alply Panels LLC.
b. Metal Sales & Service, Inc.
c. Or approved equal.

B. Panel Depth: 1 inch unless otherwise indicated on Drawings.

C. Aluminum Sheet: Tension-leveled, smooth aluminum sheet, ASTM B209, 0.0808 inch thick.

1. Exterior Finish (M4): Color Anodic Finish: AA-MA 611, AA-M12 C22 A42/A44, Class I, 0.018 mm or thicker.

a. Color: As shown on the drawings, confirmed by Commissioner from manufacturer's full range.

2. Three-Coat Fluoropolymer (M3): AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

a. Color: As shown on the drawings, confirmed by Commissioner from manufacturer's full range.

b. Attachment Assembly: Rainscreen-principle system, unless otherwise indicated.

2.3 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, G90 coating designation or ASTM A792/A792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer. Provide sealant types that are compatible with panel materials, are nonstaining, and do not damage panel finish.

2.4 FABRICATION

A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

    a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Aluminum Panels and Accessories:

1. Three-Coat Fluoropolymer (Where Indicated): AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

a. Color: Match Commissioner's approved samples.

2. Exposed Anodized Finish (Where Indicated):

a. Color Anodic Finish: AAMA 611, or thicker.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.

a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

3.4 INSTALLATION

A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Aluminum Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Attachment Assembly, General: Install attachment assembly required to support metal plate wall panels and to provide a complete weathertight wall system, including subgirts, perimeter extrusions, tracks, drainage channels, panel clips, and anchor channels.

1. Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar-material joinery, and panel-system joint seals.

E. Installation: Attach metal plate wall panels to supports at locations, spacings, and with fasteners recommended by manufacturer to achieve performance requirements specified.

1. Rainscreen Systems: Do not apply sealants to joints unless otherwise indicated.

F. Rainscreen-Principle Installation: Install using manufacturer's standard assembly with vertical channel that provides support and secondary drainage assembly, draining at base of wall. Notch vertical channel to receive support pins. Install vertical channels supported by channel brackets

or adjuster angles and at locations, spacings, and with fasteners recommended by manufacturer. Attach metal plate wall panels by inserting horizontal support pins into notches in vertical channels and into flanges of panels. Leave horizontal and vertical joints with open reveal.

1. Install metal plate wall panels to allow individual panels to be installed and removed without disturbing adjacent panels.
2. Do not apply sealants to joints unless otherwise indicated.

G. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting to provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal panel manufacturer; or, if not indicated, provide types recommended in writing by metal panel manufacturer.

H. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.5 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal plate wall panel units within installed tolerance of 1/4 inch in 20 feet, non-accumulative, on level, plumb, and location lines as indicated, and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.6 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 42 13.16

SECTION 07 46 46 - FIBER CEMENT SIDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Fiber Cement board exterior siding and exposed fastener system.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Product data describing system materials and fabrication
2. Preparation instructions and recommendations.
3. Storage and handling requirements and recommendations.
4. Installation methods.
5. Samples for verification 3 inches by 6 inches representing color.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Show compliance with the following:
1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
2. ASTM C 1186 - Standard Specification for Flat Non-Asbestos Fiber-Cement Sheets.
3. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Materials.
4. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure.
5. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver cement panels to site until job is ready for their installation.

B. Store products in manufacturer's unopened packaging until ready for installation.

C. Store materials off the ground, flat and under cover in a dry place until erection.

D. Keep materials dry and protect from freezing.

E. Store materials in such a way to accommodate easy inspection of the materials prior to installation.

PART 2 - PRODUCTS

2.1 PREFINISHED FIBER CEMENT BORAD SIDING PANELS

A. Basis of Design Product: Subject to compliance with requirements provide ½ inch cement-fiber panels by Finex Fiber Cement Boards or comparable product by one of the following:
1. Nichiha
2. Silbonet
3. Or approved equal.

B. Natural Color: grey

C. Mechanical Fasteners: Mechanical fasteners: External tamper proof screws, stainless steel, torx head fasteners with continuous cushions of black EPDM rubber.

2.2 ACCESSORIES

A. Trim: PVC, composite and stainless steel trim shapes suitable for trim conditions.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Ensure that framing is completed and that electrical rough-in, windows, doors, and flashing are in place before proceeding with work of this section.

C. If substrate preparation is the responsibility of another installer, notify Commissioner of unsatisfactory preparation before proceeding.

3.3 PREPARATION

A. Clean surfaces thoroughly prior to installation. Repair as necessary any substrate conditions that would be detrimental to proper installation

B. Ensure that all dust, dirt, fingerprints and all other foreign marks on the material are removed prior to installation of the panels.

3.4 INSTALLATION, GENERAL

A. Install in accordance with manufacturer's instructions and the approved shop drawings.

B. Panel Cutting:
   1. Cut panels using a high speed circular saw with a segmented diamond blade.
   2. Cut panels from the front side and protect the face from being damaged during cutting.
   3. For incidental cuts, cut panels from the front side using a jigsaw with a carbide tip blade.

C. Drilling:
   1. Drilling of holes must be done from the front of the panel using a carbide tip drill bit.

D. Prepare structural backing with studs, backer board, weather barrier and furring as required to meet the performance requirements specified. Install fiber reinforced panels over a properly prepared support system in accordance with the manufacturer's installation instructions.

E. Install weather barrier over prepared substrate.

F. Fiber reinforced cement panel siding must be installed over an impervious weather barrier, on furring strips with black EPDM rubber strips, and with an air cavity behind the face panel to allow ventilation of the substrate.

G. Panels must be attached to furring using the attachment pattern and fasteners indicated in the manufacturer's installation instructions and approved shop drawings.

H. Install black EPDM rubber strips to each furring member.

I. Pre-drill holes in cement boards in pattern indicated in the manufacturers installation instructions and approved shop drawings. Holes must be of size as specified by the panel manufacturer for the fasteners being used.

J. Fasten fiber cement board to furring as per vendor's details with approved stainless steel fasteners.

3.5 PROTECTION

A. Protect installed products until completion of project.

B. Inspect walls for any damage. Replace panels that are damaged. Do not attempt to repair.

C. Ensure all dirt, dust, fingerprints and all foreign marks are immediately removed from the face of the material to avoid from permanent damage.

D. Replace damaged products before Substantial Completion.

END OF SECTION 07 46 46

SECTION 07 52 16 - SBS MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Hybrid roofing system that combines built-up ply sheets with styrene-butadiene-styrene (SBS)-modified bituminous cap sheet.
2. Substrate board.
3. Roof insulation.
4. Cover board.
5. Walkways.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. For insulation and roof system component fasteners, include copy of FM Approvals' RoofNav listing.

B. Sustainable Design Submittals:

1. Product Test Reports: For roof materials, documentation indicating that roof materials comply with Solar Reflectance Index requirements.
2. Product Data: For adhesives and sealants, indicating VOC content.
3. Laboratory Test Reports: For adhesives and sealants, indicating compliance with requirements for low-emitting materials.
4. Environmental Product Declaration: For each product.
5. Health Product Declaration: For each product.
6. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.

C. Shop Drawings: Include plans, sections, details, and attachments to other work, including the following:

1. Layout and thickness of insulation.

2. Base flashings and membrane terminations.
3. Flashing details at penetrations.
4. Tapered insulation, including slopes.
5. Roof plan showing orientation of steel roof deck and orientation of roof membrane, fastening spacings, and patterns for mechanically fastened roofing system.
6. Crickets, saddles, and tapered edge strips, including slopes.
7. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
8. Tie-in with adjoining air barrier.

D. Wind Uplift Resistance Submittal: For roofing system indicating compliance with wind uplift performance requirements.

1.5 INFORMATIONAL SUBMITTALS

A. Manufacturer Certificates:

1. Performance Requirement Certificate: Signed by roof membrane manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
2. Special Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Installer with Special Experience:

1. Installer Qualifications: An entity meeting the requirements of DDC General Conditions Section 014000 1.7/C3.

1.8 WARRANTY

A. Special Warranty: Manufacturer agrees to restore or replace components of roofing system that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SBS-MODIFIED BITUMINOUS ROOFING SYSTEM

A. SBS-Modified Asphalt Base Ply Sheet: ASTM D-6163 Type I, glass-fiber-reinforced, SBS-modified asphalt sheet; suitable for application method specified.

1. Sole Source product: Paradiene 20 TG as manufactured by Siplast.

a. No Substitutions Permitted.

B. SBS-Modified Asphalt Finish Ply Sheet: ASTM D 6163, Type I, glass-fiber-reinforced, SBS-modified asphalt sheet; surfaced with ceramic granules; suitable for application method specified.

1. Sole Source product: Paradiene 30 TG as manufactured by Siplast.

a. No Substitutions Permitted.

2.2 FLASHING MATERIALS

A. Flashing Assembly: Multi-component, flexible, polymethyl methacrylate (PMMA) based resin combined with a thixotropic agent catalyst for use in combination with fleece fabric to form a monolithic, reinforced flashing membrane.

1. Sole Source product: Parapro 123 fluid reinforced flashing system, by Siplast.

a. No Substitutions Permitted.

B. PMMA Primers:

1. PMMA Primer: A two component, PMMA based primer for use over concrete, concrete repair materials, masonry substrates and wood/plywood substrates.

2. Sole Source product: Pro Primer T as manufactured by Siplast.

a. No Substitutions Permitted.

2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials recommended by manufacturer to be compatible with one another and with roofing, as demonstrated by roofing manufacturer, based on testing and field experience.

B. Insulation Adhesive. A single component, moisture cured, polyurethane foam adhesive, dispensed from a portable, pre-pressurized container used to adhere insulation panels to the substrate as well to other insulation panels.

1. Sole Source Product: Para-Stick Professional Roofing Adhesive manufactured by Siplast.

a. No substitutions Permitted.

C. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.

D. Elastomeric Sealant: A moisture-curing, non-slump elastomeric sealant designed for roofing applications. The sealant must be approved by the roof membrane manufacturer for use in conjunction with the roof membrane materials.

E. Cleaner/Solvent: A clear solvent used to prepare metal and plastic surfaces prior to application of the catalyzed resin flashing membranes and to reactivate transition areas of in-place catalyzed resin flashing membranes at tie-ins and between staged coats of resin.

2.4 INSULATION

A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

1. Approval of insulation is contingent upon approval by the membrane manufacturer for use with specified roof system.

B. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches, unless otherwise indicated.

C. Provide preformed saddles, crickets, cant strips, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

D. Isocyanurate insulation will have a 15-year time weighted average Long Term Thermal Resistance (LTTR) as determined in accordance with ASTM C1289 or CAN/ ULC-S770, Standard Test Method for Determination of Long Term Thermal Resistance of Closed Cell Thermal Insulating Foams).

1. Types as follows:

a. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class I, Grade 2, glass-fiber mat facer on both major surfaces.

2. All insulation: Factory Mutual, Class 1 or U.L. Class A.

E. Rigid Insulation:

1. Two Layers of Insulation: Two layers of insulation consisting of base layer of isocyanurate insulation.

a. Base Layer Insulation: Closed cell isocyanurate foam core skinned on both sides with factory applied facers of the generic type recommended by the membrane manufacturer.
b. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2-inch-thick, factory primed.
c. Required total roof insulation thickness: 3 inch minimum at vertical and horizontal surfaces of roof curbs, as indicated on drawings, and 6 inch at thinnest point within horizontal roof field area, or as indicated on Drawings.

d. Preformed fiberboard, ASTM C 208.
e. Minimum Long-Term Thermal Resistance (LTTR) values of insulation board, by nominal thickness of flat insulation board:

1) 2 inch: R- 11.4.
2) 4 inch: R- 23.6.

F. Tapered Insulation System: Insulation system has achieved project fire hazard classification when tested in conjunction with UL Classified built-up roofing membranes. Other tapered insulation systems which conform to project criteria may be submitted for approval.

1. Tapered Insulation: 1/8 inch slope per foot factory tapered and mitered closed cell isocyanurate foam core skinned on both sides with factory applied facers of the generic type recommended by membrane manufacturer and Factory Mutual approved for direct application over steel decks. One-inch minimum thickness at drains and valleys unless shown otherwise on Contract Drawings.
2. Tapered Insulation Crickets: 1/2 inch slope per foot factory tapered and mitered isocyanurate insulation cricket system.
3. Minimum Long-Term Thermal Resistance (LTTR) values of insulation board, by nominal thickness of flat insulation board:

a. 2 inch at thick edge: R- 10.
b. 4 inch at thick edge: R- 22.1.

4. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2-inch-thick, factory primed.

2.5 VAPOR BARRIER

A. Laminated Sheet: Two layers, fire-retardant polyethylene laminate, reinforced with cord grid, compatible for installation with other assembly materials and components.

1. Permeance Rating: Not more than 0.062 perm.
2. Flame Spread Index: Not more than 5 when tested in accordance with ASTM E84.
3. Smoke-Developed Index: Not more than 35 when tested in accordance with ASTM E84.
4. Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

B. Self-Adhering-Sheet Vapor Retarder: Polyethylene film laminated to layer of butyl rubber adhesive, minimum 30-mil- total thickness; maximum permeance rating of 0.1 perm; cold applied, with slip-resisting surface and release paper backing. Provide primer when recommended by vapor-retarder manufacturer.

2.6 COVERBOARD

A. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2-inch-thick, factory primed.

2.7 FASTENERS

A. Fasteners for Securing Built-Up Base Flashing:

1. Wood Surfaces: Annular ring roofing nail with one-inch solid cap or equivalent fastener.
2. Metal Surfaces: Hardened, self-tapping #10 sheet metal screw thru one-inch diameter sheet metal disk.
3. Masonry Surfaces: Hardened, masonry nail or drive pin, thru one-inch dia. sheet metal disk.

2.8 MISCELLANEOUS MATERIALS

A. Cant Strips (For built-up base Flashings).

B. Tapered Edgestrips (around drains and at other areas where insulation must be feathered down).

C. Walkway Pads/ Splash Pads/ Protection Pads at access equipment locations indicated.

1. Homogeneous core of asphalt, plasticizers and inert fillers, bonded by heat and pressure between two saturated and coated sheets of organic felt and coated on top surface with ceramic granules. Minimum thickness 3/ 4 inch.
2. Size: min. 3/8 inch thick by 32 by 32 inches.
3. Color: White, with reflective top surface complying with either of the following:

a. Minimum initial solar reflectance index (SRI) of 0.7 complying with Local Law 94(2019) and a minimum thermal emittance of 0.75 or a minimum solar reflective index (SRI) of 82.
b. Minimum initial reflectivity in accordance with ASTM C 1549: 0.72.

D. Materials for Pitch Pockets:

1. Mortar: ASTM C 270, Type S.
2. Elastomeric Cement: Non-sag, cold applied, trowel grade, single component rubber elastomer. Minimum elongation 400 percent.

E. Broadcast Granules: Manufacturers standard material for coverage of bleed- out areas.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify that Work of other trades which penetrates the roof deck has been completed.

B. Examine surfaces for inadequate anchorage, foreign material, moisture, and unevenness which would prevent the execution, and quality of application, of the built-up roofing system as specified.

C. Do not proceed with application of built-up roofing system until defects are corrected.

3.3 PREPARATION

A. Moisture Testing for Roof Deck.

3.4 HEATING BITUMEN

A. Preparation:

1. Heating bitumen will be performed in accordance with FDNY, NYS DOL, and New York City Department of Buildings regulations.
2. Use separate kettles or tankers for heating different types of asphalt.
3. The heating process will be strictly regulated by means of an automatic thermostatic control of an approved type for positive temperature control. Kettles or tankers will be the immersion tube type, fire by Liquid LP gas, and will have 100% safety shutoff.
4. Equip each kettle or tanker with a recording thermometer that will graphically indicate and record on a chart the maximum and minimum temperatures to which materials have been heated. Recording thermometers will be capable of accurately recording temperatures as high as 600 degrees F. and as low as 0 degrees F. The thermometers will be properly maintained at all times.

    a. Kettles or tankers without recording thermometers in good working condition will not be used.
    b. At the end of each working day, turn the chart from the thermometer on each kettle or tanker over to Commissioner.
    c. If any bitumen is overheated, remove it from the site in the presence of Commissioner.

5. If any underheated or overheated bitumen has been applied on the roof, remove that portion of the roof.

    a. Only one gas cylinder will be on the roof at any one time. Locate the cylinder at least four feet away from the kettle. Vertically brace the cylinder and shade it from the sun.
    b. Provide fire extinguishers on the roof in the vicinity of the kettles as required to ensure the safety of the roof.

B. Heating Asphalt Bitumen:

1. Heat the bitumen in accordance with the Equiviscous Temperature information furnished by the bitumen manufacturer for that specific run of bitumen.

    a. In no case will be asphalt be heated to or above the actual COC Flash Point (ANSI/ASTM D-92); or the finished blowing temperature for more than 4 hours.
    b. Maintain the temperature of the bitumen at the point of application within the Equiviscous Temperature Range. Use insulated pipes, buckets, luggers, and other insulated roofer's equipment as required by the field conditions.
    c. Provide a minimum of one hand- held thermometer for each crew installing hot

asphalt in order to ensure compliance with EVT.

2. Application temperature: The accepted application temperature range for asphalt is the equiviscous temperature, (EVT) 25 F. All felt installation must occur in this range to be acceptable.

3.5 INSTALLING VENT BASE SHEET

A. Install one ply of vent base sheet. Vent sheets will be butted.

B. Using vent base sheet, start at the low edge of the roof. Install vent base sheet by spot mopping. The spot mopping will be applied by machine at the rate of approximately 7 lbs. per square. The spots will be approximately 12" in diameter and 24" o.c. Stagger each row.

C. Run vent base sheet up the perimeter or parapet walls to the height of the counter flashing, spot adhering as required. This will allow for proper perimeter venting detail.

3.6 INSTALLING VAPOR BARRIER

A. General: Install vapor barrier in compliance with manufacturer's written instructions and approved Shop Drawings.

B. Extend the vapor barrier beyond all edges and openings of the roof so that it can be turned up over the insulation a minimum of 6".

1. If vapor barrier is punctured, restore immediately with fiberglass felt embedded in hot bitumen.
2. Install the insulation and roofing membrane immediately (same day) as the vapor barrier is installed. Where not possible, protect the vapor barrier with a glaze coat of hot bitumen applied at the rate of 15 lbs. per square.

3.7 INSTALLING INSULATION

A. Installing Single Layer Insulation: Install the insulation with the long joints running in a continuous straight line perpendicular to the direction of the roof membrane. Stagger end joints. Butt edges and ends snugly. Occasional joint widths up to 1/8" will be allowed if approved by the Commissioner.

1. Set the insulation in a full hot mopping of Type III steep asphalt applied at the rate of 30 lbs. per square. Press the insulation into the bitumen to a firm and uniform bearing.

B. Installing Double Layer Insulation: Install the insulation in 2 separate layers with the long joints of each layer running in the same direction in a continuous straight line perpendicular to the direction of the roof membrane. Stagger end joints. Install the top layer of insulation with joints staggered from the joints of the base layer.

1. Set each layer of insulation in a full hot mopping of Type III steep asphalt applied at the rate of 30 lbs. per square. Press the insulation into the bitumen to a firm and uniform bearing.

C. Installing Tapered Insulation: Follow the manufacturer's Shop Drawings and instructions for laying out the tapered insulation system, and cricket system (if any). Install the overlay insulation over the tapered insulation system, with joints staggered from each layer.

1. Butt edges and ends snugly. Occasional joint widths up to 1/8" will be allowed if approved by the Commissioner.
2. Set each layer of insulation in a full hot mopping of Type III steep asphalt applied at the rate of 30 lbs. per square. Press the insulation into the bitumen to a firm and uniform bearing.
3. Install the insulation manufacturer's fiberglass roof tape over all joints of the overlay insulation. Embed the tape in hot steep asphalt.

D. Keep insulation dry at all times. Discard insulation that contains moisture.

1. Install only as much insulation as can be covered with roofing membrane the same day.
2. Discard all units with broken corners or similar defects.
3. At roof drains, terminate the insulation with tapered edge strips so that all flashing and coverstrip joint laps can be made within the tapered portion.
4. Set all cant strips in a solid application of hot bitumen so they are firmly anchored to the deck and the vertical surface.

E. Installation of insulation will be in strict compliance with the Manufacturer's recommendations.

3.8 INSTALLING BUILT-UP ROOF

A. Before application of roof membrane, turn vapor barrier over insulation at all edges and openings and embed in a full hot application of bitumen. At round openings, seal the edges of the insulation with a trowel coat of plastic roof cement.

B. Installing Built-Up Roof Membrane:

1. For asphalt built-up roofs, install built-up roof membrane consisting of 5 plies of asphalt fiberglass felt. Embed each ply in solid mopping of hot asphalt applied at the rate of 25 lbs. per square.
2. Ply felts installation:

a. Start at low edge of the roof deck.
b. Apply one 12 inch wide piece of ply felt.
c. Apply over 12 inch felt one 24-inch wide felt.
d. Apply over 24 inch felt, a full 36 inch wide felt.
e. Install the final (4th) ply at full width.

1) Rate: 23 pounds per square for each layer of felt.

3. Install each felt so that it is firmly and uniformly set, in hot asphalt, without voids.
4. Dry edges of any depth will not be tolerated.
5. All such edges will be cut out and patched with an equal number of plies.

C. Laying Felt:

1. Start laying felts, using split sheets as necessary to secure the required number of plies and laps. Provide 10" minimum end laps. Roll all roofing felt not more than 5'-0" behind the mop as it spreads the bitumen, brooming and pressing the felts into the bitumen from the center outward to the edges so as to ensure thorough sticking and a smooth, firm surface, free of blisters, wrinkles, or buckles.
2. Use three persons for the application of roofing felt as follows; one person to spread bitumen in front of the roll, one person to roll out the felt and one person to smooth out the felt with a stiff street broom or squeegee. The roofing may be installed with an approved applicating machine and broomed or squeegeed smooth producing an equivalent result. In no case will the felt be rolled out dry and then laid in the bitumen.
3. Where built-up flashings are required, extend the mopped roofing felts 2" beyond the top edge of the cant.
4. Where sheet metal base flashings are required, turn up mopped roofing felts a minimum of 4" on all vertical surfaces or apply additional felt plies.
5. Any protection ply or temporary ply will not be deemed a part of the 5-ply system.

D. Phasing of Roofing Membrane Installation:

1. Phasing of ply felt application will not be allowed in any case.
2. Where necessitated by job conditions and with approval of the Commissioner, a protective glaze coating may be applied as follows:

   a. Apply protective glaze coatings in addition to other coating or mopping indicated and required by project application. Reduction or omission of specified prime coats, mopped bitumen, flood coats or finish coats in lieu of glaze coatings is not permitted.
   b. Smooth Surface Roofs: If permitted under the manufacturer's Specifications, apply glaze coating of hot bitumen at the rate of 15 lbs. per square, unless asphalt emulsion is applied the same day.

3. All exposed felts, regardless of type, must be protected with specified surfacing or glaze coating by the end of each working day.
4. Asphalt will bleed out past the edge of the sheet by a minimum of 1/ 4 inch, then broadcast granules over bleed out area. Take great care to ensure that the roof has a consistent and monolithic look.
5. Continue the installation of roofing materials on the following workday (weather permitting). Glaze coated surfaces must be clean and dry to ensure complete bonding of felts or coatings.

E. Temporary Flashings:

1. Provide a temporary waterproof seal at all membrane edges, penetrations, drains, etc. Unless complete flashings are installed immediately (same working day) following the membrane application.

F. Installing Built-Up Flashings:

1. Apply asphalt primer to all vertical surfaces before application of built-up flashings.
2. Install built-up flashing consisting of 2 plies of asphalt fiberglass felt, topped with one ply of modified bitumen flashing membrane.

3. Cut all felts into strips not longer than 12 feet. Provide 3" minimum end laps. Stagger all end laps. Cut modified bitumen flashing membrane the width of the roll.
4. Install all plies in hot steep asphalt or if desired install felt in plastic cement, and modified flashing in MBR adhesive.
5. Fasten the top edge of the built-up flashings 8" oc.
6. Seal top edge of flashing with a trowel coat of plastic cement and fabric. If roof system is vented do not seal the top edge.

G. Installing Metal Flashings and Coverstrips:

1. Asphalt Roofs: Plastic Asphalt Cement.
2. Prime metal surfaces and embed portions of all metal flashing which extend over the roof surface in plastic cement.
3. Completely cover all portions of metal flashings which extend over the roof surface with two asphalt fiberglass felt cover strips, each set in plastic cement. Provide strips that are at least 8" and 12" wide respectively. In all cases, carry the strips past the edge of the metal flange and beyond the edge of the preceding felt 4" min. Seal junction of metal and coverstrip with plastic cement.
4. Coat and surface the top ply to match the adjacent roofing membrane.

   a. Cap Sheet Joints: Asphalt must bleed out past the edge of the sheet by a minimum of 1/4” inch. Treat bleed-out as directed by Commissioner. Broadcast granules over bleed out area. Take great care to ensure that the roof has a consistent and aesthetically uniform monolithic look.

5. At roof drains, install cover strips within the slope to the drain so that they do not impede the flow of water from the roof.

H. Installing elastomeric liquid-applied flashing membrane:

1. At pipe, vent, stanchion, and miscellaneous roofing penetrations, unless otherwise indicated.

I. Filling Pitch Pockets: Fill bottom half of pitch pocket with cement mortar. Fill remaining half of pitch pocket with elastomeric cement. Slope surface to shed water.

3.9 FLOOD TESTING

A. After completion of roofing work specified above, all drains will be plugged and all roofs of above locations of Work will be flooded with a minimum of 1" of water above the high points. Water will remain for a minimum of 24 hours. If leaks occur, Perform necessary work to correct leaks and repeated flood testing, until no leaks occur.

B. Refer to DDC General Conditions 01 91 15 "General Commissioning Requirements for Building Enclosure" and 01 91 19.43 “Exterior Enclosure Commissioning” for testing procedures and requirements.

3.10 FIELD QUALITY CONTROL

A. Field Samples

1. Draw a quart sample from each load of bitumen arriving at the job site in the presence of Commissioner for laboratory analysis.

B. Test Strip if requested by Commissioner:

1. When and where directed by Commissioner, and before surfacing is applied to the completed membrane, cut a strip 3" wide by 40" long thru all plies of the built-up roofing. Number of such test strips may be as required by the Commissioner.

   a. After removal of the strip, immediately restore the area by applying the same number of plies of the same kind of felt and bitumen to fill the hole level.
   b. Repeat the same number of plies of the same kind of felt and bitumen over the filled strip with the first ply lapping each edge 12" and each succeeding ply lapping the preceding ply by at least 3" on all edges.
   c. Apply surfacing material to match the adjoining roof. Turn the test strips over to Commissioner for examination.

2. If the test strips indicate the roofing system complies with the project requirements, Commissioner's will bear the expense of the test strip Work.
3. If the strips indicate the roofing system does not comply with the project requirements, assume expense of the test strip Work and will restore or replace all roofing Work as required for compliance, at no expense to the City of New York.

C. Non-Compliance: Failure of the bitumen samples or the test strip samples to meet the Specification requirements will be cause for rejection of the Work including removal and reinstallation of the work at the expense of the Contractor.

D. Inspection: After roofing system Work is completed, an inspection will be made by the roofing system manufacturer's representative. The representative will certify that roofing system has been installed according to the Specifications.

1. Inform the Commissioner of scheduled inspection date a minimum of one (1) week in advance of the inspection.

3.11 CLEANING

A. Remove bitumen from surfaces other than those requiring bituminous coatings.

B. Remove all debris from roof area.

C. Maintain roof area free from debris throughout the period of construction and during construction activities following roof insulation until date of Substantial Completion.

END OF SECTION 07 52 16

SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Manufactured reglets with counterflashing.
2. Formed roof-drainage sheet metal fabrications.
3. Formed low-slope roof sheet metal fabrications.
4. Formed wall sheet metal fabrications.
5. Formed equipment support flashing.
6. Downspouts.
7. Scuppers.

1.3 COORDINATION

A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.6 ACTION SUBMITTALS

A. Product Data: For each of the following

1. Underlayment materials.
2. Elastomeric sealant.
3. Butyl sealant.
4. Epoxy seam sealer.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Include details of termination points and assemblies.
7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
8. Include details of roof-penetration flashing.
9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, flashings, and counterflashings.
10. Include details of special conditions.
11. Include details of connections to adjoining work.

C. Samples: For each exposed product and for each color and texture specified, 12 inches long by actual width.

1.7 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of coping and roof edge flashing that is ANSI/SPRI/FM 4435/ES-1 tested and FM Approvals approved.

B. Product Test Reports: For each product, for tests performed by a qualified testing agency.

C. Evaluation Reports: For copings and roof edge flashing, from an agency acceptable to the City of New York, and ICC-ES showing compliance with ANSI/SPRI/FM 4435/ES-1.

1.8 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.9 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Qualification Data: Fabricator and Installer with Special Experience.

1. Fabrication Qualifications: An entity meeting the requirements of DDC General Conditions Section 0140000 1.7/C/2.

2. Installer Qualifications: An entity meeting the requirements of DDC General Conditions Section 0140000 1.7/C/1.

3. For copings and roof edge flashings that are ANSI/SPRI/FM 4435/ES-1 tested and FM Approvals approved, shop must be listed as able to fabricate required details as tested and approved.
4. Maintain the on-site facade mockup at the project site until directed to demolish and remove the on-site facade mockup by the Commissioner.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies will withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim will not rattle, leak, or loosen, and will remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. SPRI Wind Design Standard: Manufacture and install copings and roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:

1. Design Pressure: roof field 52 psf, roof perimeter 87 psf, roof corners 130 psf

D. FM Approvals Listing: Manufacture and install copings roof edge flashings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-120. Identify materials with name of fabricator and design approved by FM Approvals.

E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.

B. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, dead soft, fully annealed.

1. Finish: 2D (dull, cold rolled).
2. Surface: Smooth, flat.

2.3 UNDERLAYMENT MATERIALS

A. Self-Adhering, High-Temperature Sheet: Minimum 30 mils thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Carlisle Coatings & Waterproofing Inc; CCW WIP 300HT.
b. GCP Applied Technologies Inc.; Grace Ice and Water Shield HT.
c. Henry Company; Blueskin PE200 HT.
d. Or approved equal.

2. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F or higher.

2.4 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Fasteners: Suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
b. Blind Fasteners: Stainless-steel rivets suitable for metal being fastened.

2. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.

C. Solder:

1. For Stainless Steel: ASTM B 32, Grade Sn60, with an acid flux of type recommended by stainless-steel sheet manufacturer.

D. Stainless-Steel Welding Rods: Type recommended by stainless-steel sheet manufacturer for type of metal sheets furnished.

E. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2-inch-wide and 1/8 inch thick.

F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

G. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

H. Manufactured Flashing: For use under sills and other applications indicated.

1. Flashing Material: Type 304 stainless steel, 0.019 inch thick.
2. Basis of Design Product: Subject to compliance with requirements, provide STF Sawtooth Flashing as supplied by Hohmann & Barnard, Inc. or comparable product by one of the following:

a. Cheney Flashing Company.
b. Fry Reglet Corporation.
c. Heckmann Building Products, Inc.
d. Or approved equal.

2.5 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.

1. Fabricate sheet metal flashing in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
2. Obtain field measurements for accurate fit before shop fabrication.
3. Form sheet metal flashing without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.

B. Fabrication Tolerances: Fabricate sheet metal flashing that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

C. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.

D. Fabricate attachment devices from same material as accessory being anchored.

E. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.

F. Do not use graphite pencils to mark metal surfaces.

2.6 ROOF-DRAINAGE SHEET METAL FABRICATIONS

A. Parapet Scuppers: Fabricate scuppers to dimensions required, with closure flange trim to exterior, 4-inch-wide wall flanges to interior, and base extending 4 inches beyond cant or tapered strip into field of roof. Fabricate from the following materials:

1. Stainless Steel: 0.019 inch thick.

2.7 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Copings: Fabricate in minimum 96-inch- long, but not exceeding 12-foot- long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, fasten and seal watertight. Shop fabricate interior and exterior corners.

1. Coping Profile: As indicated on the Drawings, and in accordance with SMACNA's "Architectural Sheet Metal Manual."
2. Joint Style: Butted with expansion space and 6-inch- wide, exposed cover plate unless otherwise indicated.
3. Fabricate from the following materials:

a. Aluminum: Minimum 0.050 inch thick.
b. Finish: To match Commissioner’s Sample.

B. Roof Edge Flashing and Fascia Cap: Fabricate in minimum 96-inch-long, but not exceeding 12-foot-long sections. Furnish with 6-inch-wide, joint cover plates. Shop fabricates interior and exterior corners.

1. Joint Style: Butted with expansion space and 6-inch-wide, concealed backup plate.
2. Fabricate with scuppers spaced 10 feet apart, to dimensions required with 4-inch-wide flanges and base extending 4 inches beyond cant or tapered strip into field of roof. Fasten angles to base of scupper.
3. Fabricate from one of the following materials:

a. Aluminum: Minimum 0.050 inch thick.
b. Finish: To match Commissioner’s Sample.

C. Roof-Penetration Flashing: Fabricate from the following materials:

a. Aluminum: Minimum 0.050 inch thick.
b. Finish: To match Commissioner’s Sample.

D. Roof-Drain Flashing: Fabricate from the following materials:

a. Aluminum: Minimum 0.050 inch thick.
b. Finish: To match Commissioner's Sample.

E. Downspouts: Fabricate rectangular downspouts to dimensions indicated on Drawings, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors. Shop fabricate elbows.

1. Fabricated Hanger Style: in accordance with SMACNA's "Architectural Sheet Metal Manual."
2. Fabricate from the following materials:

a. Aluminum: Minimum 0.050 inch thick.
b. Finish: To match Commissioner's Sample.

2.8 WALL SHEET METAL FABRICATIONS

A. Opening Flashings in Construction: Fabricate flashings to extend a minimum of 4 inches beyond wall openings and the same dimension onto ducts.

1. Stainless Steel: 0.016 inch thick.

2.9 MISCELLANEOUS SHEET METAL FABRICATIONS

A. Equipment Support Flashing: Fabricate from the following materials:

1. Stainless Steel: 0.019 inch thick.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of the Work.

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

B. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 UNDERLAYMENT INSTALLATION

A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

B. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps and edges with roller. Cover underlayment within 14 days.

3.4 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. Install sheet metal flashing to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
3. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
4. Install sealant tape where required by installation conditions.
5. Torch cutting of sheet metal flashing and trim is not permitted.
6. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.

1. Coat back side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.

C. Seal joints as shown and as required for watertight construction.

1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
2. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 - Joint Sealants.

D. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches, except reduce pre-tinning where pre-tinned surface would show in completed Work.

1. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
2. Stainless-Steel Soldering: Tin edges of uncoated sheets using solder recommended for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

3.5 ROOF-DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

B. Downspouts:

1. Join sections with 1-1/2-inch telescoping joints.
2. Provide hangers with fasteners designed to hold downspouts securely to walls.
3. Locate hangers at top and bottom and at approximately 60 inches o.c.

3.6 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.

C. Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.

1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 24-inch centers.
2. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch centers.

D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.

E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints minimum of 4 inches. Secure in waterproof manner by means of interlocking folded seam or blind rivets and sealant unless otherwise indicated.

F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with butyl sealant and clamp flashing to pipes that penetrate roof.

3.7 WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components.

3.8 MISCELLANEOUS FLASHING INSTALLATION

A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

3.9 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.10 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.

E. Replace sheet metal flashing that have been damaged or that have deteriorated beyond successful restoration by finish touchup or similar minor restoration procedures.

END OF SECTION 07 62 00

SECTION 07 72 36 – SMOKE VENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract."

1.2 SUMMARY

A. Section Includes:

1. Elevator Hoist Way Smoke Vent.

B. Related Requirements:

1. Section 07 52 16”SBS Modified Bituminous Membrane Roofing”.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 "Quality Requirements."
1. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by the manufacturer.

C. Automatic smoke vent to be UL listed.

PART 2 - PRODUCTS

2.1 AUTOMATIC SMOKE VENT

A. Basis of Design Product: Subject to compliance with requirements, provide "type SV Automatic Roof Smoke Vent" as manufactured by The Bilco Company or comparable product by one of the following:

1. Carolina Atlantic.
2. Babcock Davis.
3. Or approved equal.

B. Roof fire vent to be single leaf and preassembled with a minimum free area of 2 square feet.

C. Performance Characteristics:

1. Roof vent hatch to have electric latch release mechanism and built-in louvers to meet elevator shaft code requirements.
2. Cover to be reinforced to support a minimum live load of 40 psf (195kg/m^2) with a maximum deflection of 1/150th of the span or 20 psf (97 kg/m^2) wind uplift.
3. Lifting mechanism assemblies must open the vent covers simultaneously when latch is manually released or via electric actuation, or when heat breaks the UL listed fusible link. Opening to be in a controlled manner to avoid damage to surrounding roof surfaces.
4. Entire roof fire vent to be weather tight with fully welded corner joints on cover and curb.
5. Permanently open louvered opening to have wire mesh screen.
6. Latch mechanisms must hold the covers in the closed position without overstressing the fusible link and withstand 30 psf (146 kg/m^2) wind uplift forces acting on the cover.
7. Latch operation (smoke detector): Electric latch release mechanism must be capable of operation via smoke detector or via fire alarm panel. Upon receiving actuation signal, the latch to activate instantaneously, allowing vent cover to open.
8. Latch operation (Fusible Link): When heat parts the UL listed fusible link, the latch must release instantaneously, allowing vent cover to open. The latch to be designed for easy resetting, after a fire or test, so that the cover cannot be latched closed unless the mechanism has been reset properly. Manufacturer to provide instructions for resetting the latch with each unit.

D. Cover: 14 gauge paint bond G-90 galvanized steel.

E. Cover insulation: Fiberglass of 1" thickness, fully covered and protected by a metal liner paint bond G-90 galvanized steel.

F. Curb: Minimum 18" in height and of 14 gauge paint bond G-90 galvanized steel. Curb to be formed with a 3-1/2" flange with 7/16" holes provided for securing to roof deck. Curb to be equipped with integral metal cap flashing of the same gauge and material as the curb and feature stamped tabs, 6" on center, to be bent inward to hold single-ply roofing membrane securely in place. Curb to have a heavy extruded EPDM rubber gasket that is mechanically fastened to the top of the curb to assure a continuous seal when compressed by the cover.

G. Curb Insulation: Rigid, high-density fiberboard of 1" thickness on the outside of curb.

H. Curb Louvers: Smoke hatch for elevator shafts to incorporate built-in louvers with wire mesh to meet elevator-shaft code requirements.

I. Lifting mechanisms: Manufacturer to provide compression spring operators enclosed in telescopic tubes to open the covers against a snow/wind load. Upper tube to be the outer tube to prevent accumulation of moisture, grit, and debris inside lower tube assembly. Lower tube to interlock with a flanged support shoe.

J. Latch mechanism: Must be the positive hold/release mechanism controlled by a single UL listed 165°F (74°C) fusible link and automatic operation via electric actuation from smoke detector or fire alarm panel. Fusible link to be curb mounted on a non-hinged end to allow the latching mechanism to be easily reset from the roof level.

K. Hardware

1. Heavy pintle hinges to be provided.
2. Cover to automatically lock in the open position with a rigid hold open arm equipped with a 1” diameter red vinyl grip handle to permit easy release for closing.
3. Compression spring tubes to be an anti-corrosive composite material and all other hardware to be zinc plated and chromate sealed.
4. Cover hardware to be bolted into heavy gauge channel reinforcing welded to the underside of the cover and concealed within the insulation space.
5. Heavy duty shock absorbers: To be provided to assure controlled opening of the covers.

L. Manual pull release cables: Interior and exterior cables with red vinyl grips to be provided and allow the unit to be opened without disturbing the fusible link.

M. Finishes: Factory finish to be alkyd based red oxide primed steel.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates and openings for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Install products in strict accordance with manufacturer’s instructions and approved submittals. Locate unit level, plumb, and in proper alignment with adjacent work.

1. Test units for proper function and adjust until proper operation is achieved.

2. Test fusible link and install replacement fusible link after testing.
3. Repair finishes damaged during installation.
4. Restore finishes so no evidence remains of corrective work.

END OF SECTION 07 26 36

SECTION 07 72 73 - VEGETATED ROOF SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Tray-type vegetated roof assemblies.

B. Related Requirements:

1. Section 07 52 16 "SBS Modified Bituminous Membrane Roofing" for roofing membrane, roof thermal insulation, aggregate or roof-paver ballast, and roofing system guarantee.

1.3 DEFINITIONS

A. Captured Water: Water that is retained in the drainage layer of a vegetated roof assembly after new water additions have ceased and that cannot escape the roof except through evaporation or plant transpiration.

B. Finish Elevation: Elevation of finished growing-media surface of planting area.

C. Planting Area: Areas to be planted.

D. Plant; Plants; Plant Material: Vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

E. Growing Medium: Manufactured, lightweight soil mixture that promotes good growing conditions for specific varieties of plants.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.6 ACTION SUBMITTALS

A. Product Data: For each vegetated roof assembly.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Include material descriptions for each growing medium.

B. Shop Drawings: For each vegetated roof assembly.

1. Include plans, sections, slopes, and drain locations.
2. Indicate dimensions, weights, and loads.
3. Detail field assembly of components, depth of growing media, and attachments to other work.
4. Indicate locations of irrigation coordination with lighting and accessories.

C. Samples for Verification: For each of the following components of vegetated roof assembly:

1. Preplanted Vegetative Mat: 12 by 12 inches.
2. Growing Media: 1-quart volume of each growing medium, in sealed plastic bags labeled with content and source. Each Sample must be typical of the lots of growing media to be furnished. Provide an accurate representation of texture and composition.
3. Drainage Panels: 12 by 12 inches.
4. Root Barrier: 12 by 12 inches.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For each type of manufactured product.

1. Manufacturer's certified analysis of standard products.
2. Analysis of other materials by a recognized laboratory, according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Product Test Reports: For complete analysis of each growing medium, for tests performed by manufacturer and witnessed by a qualified testing agency or by a qualified testing agency.

D. Field quality-control reports.

1.8 CLOSEOUT SUBMITTALS

A. Maintenance Data: For vegetated roof assembly and plants, including a recommended maintenance plan with procedures for inspection and care during a calendar year. Submit before start of required guarantee and maintenance periods.

1.9 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Installer Qualifications: A qualified vegetated roof assembly Installer, approved, authorized, or licensed by roofing-membrane manufacturer, whose work has resulted in successful establishment of vegetated roofs.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with ASTM2400.

B. Handle and store materials, and place equipment in a manner to avoid overloading roof structure or damaging roofing membrane.

1.11 FIELD CONDITIONS

A. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and guarantee requirements.

1.12 GUARANTEE

A. Special Contractor's Guarantee for Vegetated Roof Assembly: Installer agrees to repair or replace components of vegetated roof assembly that fail in materials or workmanship within specified guarantee period.

1. Failures include, but are not limited to, ponding water or prolonged wetness of growing medium caused as a result of failure of the assembly to properly drain.

B. Special Contractor's Guarantee for Plant Growth: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified guarantee period.

1. Foliage Cover: Planted materials must grow to achieve and maintain at least 80 percent foliage cover over planting area commencing 24 months after planting, through the duration of this guarantee.
2. Failures include, but are not limited to, death and unsatisfactory growth except for defects resulting from abuse, lack of adequate maintenance, neglect by City of New York, or incidents that are beyond Contractor's control.

3. Include the following remedial actions as a minimum:

a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.

b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of guarantee period.
c. A limit of one replacement of each plant will be required except for losses or replacements due to failure to comply with requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain vegetated roof assembly components growing medium and accessories from single source from single manufacturer.

2.2 VEGETATED ROOF ASSEMBLIES

A. Tray-Type Vegetated Roof Assembly: Modular assembly consisting of manufacturer's standard, preplanted trays for field assembly adjacent to and interlocking with each other over roofing system.

1. Basis of Design Product: Subject to compliance with requirements, provide “Gro Vista 4” Lite” as manufactured by Green Roof Outfitters, or comparable product by one of the following:

a. Carlisle Syntec Systems.
b. Firestone Building Products.
c. Or approved equal.

2. Tray Depth, Nominal: 4 inches.
3. Tray Size: Manufacturer's standard.
4. Assembly Weight: Maximum 20 lb/sq. ft., including growing medium and plants and saturated with captured water, but not including weight of roofing system.
5. Plantings: Preplanted vegetative mat as selected by Commissioner from manufacturer's standard mixes.

2.3 VEGETATED ROOF ASSEMBLY COMPONENTS

A. Drainage Panels: Assembly manufacturer's standard drainage board formed from geotextile-faced, molded-plastic sheet with a geotextile face and "cups" of the molded sheet facing upward like small reservoirs to retain water while allowing excess water to drain away below the board or geotextile-faced, entangled plastic-filament core.

2.4 ACCESSORIES

A. Protection Board: ASTM D6506, semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners; 1/4-inch nominal thickness Insert requirement.

B. Root Barrier: Vegetated roof assembly manufacturer's standard plastic sheet manufactured from recycled polyethylene or polypropylene plastic; formulated to resist root growth and bacteria.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine each area to receive vegetated roof assembly for compliance with requirements for installation tolerances and other conditions affecting performance.

1. Verify that perimeter and other flashings are in place and secure along entire lengths where they will be covered by vegetated roof assembly.

3.3 INSTALLATION, GENERAL

A. Protection Course: Cover roofing system with protection board with butted and fully taped joints before roofing system is subject to vegetated roof assembly installation work.

B. Install vegetated roof assembly according to manufacturer's written instructions.

3.4 FIELD QUALITY CONTROL

A. Perform the following tests:

1. Flood Testing: Flood test each deck area for leaks, according to procedures in ASTM D5957, after completing and protecting roofing membrane but before placing overlaying construction. Install temporary containment assemblies, plug or dam drains, and flood with potable water.

a. Flood to an average depth of 2-1/2 inches, with a minimum depth of 1 inch and a maximum depth of 4 inches. Maintain 2 inches of clearance from top of sheet flashings.
b. Flood each area for 24 hours.

B. Correct deficiencies in work that do not comply with requirements.

C. Prepare test and inspection reports.

3.5 PROTECTION

A. Protect vegetated roof assemblies from damage, including growing-medium contamination, due to operations of other trades. Repair or replace damaged vegetated roof assemblies.

3.6 GUARANTEE SERVICE

A. Guarantee Service: Provide maintenance by skilled employees of vegetated roof assembly Installer approved by roofing-membrane manufacturer. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than the specified maintenance period.

1. Assembly and Plant Maintenance: During guarantee period, maintain plantings by cultivating, watering, weeding, fertilizing, adjusting and repairing devices, resetting plants to proper elevations or vertical position, and performing other operations as required to establish healthy, viable plantings

a. Replace growing medium that becomes displaced or eroded because of settling or other processes.
b. Apply treatments as required to keep plant materials, planted areas, and growing medium free of pests and pathogens or disease. Use integrated past management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as mechanical controls such as traps, and biological control agents.
c. Use only products and methods acceptable to roofing-membrane manufacturer.

2. Guarantee Period: 24 months from date of Substantial Completion.

3. Planting must be completed within the construction schedule.

END OF SECTION 07 72 73

SECTION 07 81 00 - APPLIED FIREPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section includes:

1. Concealed and exposed sprayed fire-resistive materials (SFRM).
2. Installation accessories.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review products, design ratings, restrained and unrestrained conditions, densities, thicknesses, bond strengths, and other performance requirements.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:
1. Product Data: For paints and coatings, indicating VOC content.
2. Laboratory Test Reports: For paints and coatings, indicating compliance with requirements for low-emitting materials.

C. Shop Drawings:
1. Include all relevant plans.
2. Show location, type and thickness of material and required ratings.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For each type of fireproofing.

C. Evaluation Reports: For fireproofing, from ICC-ES.

D. Field quality-control reports.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Installer Qualifications: Installer must be properly trained by the fireproofing material manufacturer.

C. Compatibility and Adhesion Testing: Engage a qualified testing and inspecting agency to test for compliance with requirements for specified performance and test methods.

1. Test for bond per ASTM E 736 and requirements in UL's "Fire Resistance Directory" for coating materials. Provide bond strength indicated in referenced fire-resistance design, but not less than minimum specified within this Section.
2. Verify that manufacturer, through its own laboratory testing or field experience, has not found primers or coatings to be incompatible with sprayed fire-resistive material.

1.8 SEQUENCING

A. Sequence and coordinate application of fireproofing to avoid unnecessary exposure of fireproofing to abrasion and other damage likely to occur during construction operations.

1. Ensure that fireproofing is installed prior to installation of enclosing or concealing work, with sufficient time allowed for inspection, testing and correction of defective fireproofing.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not apply fireproofing when ambient or substrate temperature is 44 deg F or lower unless temporary protection and heat are provided to maintain temperature at or above this level for 24 hours before, during, and for 24 hours after product application.

B. Ventilation: Ventilate building spaces during and after application of fireproofing, providing complete air exchanges according to manufacturer's written instructions. Use natural means or, if they are inadequate, forced-air circulation until fireproofing dries thoroughly.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form, signed by Contractor and by Installer, in which manufacturer agrees to repair or replace SFRMs that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Cracking, flaking, spalling, or eroding in excess of specified requirements; peeling; or delaminating of SFRM from substrates.
b. Not covered under the warranty are failures due to damage by occupants and The City of New York's maintenance personnel, exposure to environmental conditions other than those investigated and approved during fire-response testing, and other causes not reasonably foreseeable under conditions of normal use.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Assemblies: Provide fireproofing, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.

B. Source Limitations: Obtain fireproofing for each fire-resistance design from single source.

C. Fire-Resistance Design: Indicated on Drawings, tested according to ASTM E 119 or UL 263; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Steel members are to be considered unrestrained unless specifically noted otherwise.

D. Material Emissions and Pollutant Control: Field-applied coatings will comply with either of the following:

1. Low-Emitting Materials: VOC emissions will comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." Formaldehyde emissions will not exceed 9 mcg/cu. m or 7 ppb, whichever is less.
2. VOC content will not exceed limits of the following, unless otherwise required by the New York City Department of Buildings:

a. Flat Coatings: 50 g/L.
b. Nonflat Coatings: 100 g/L.
c. Primers, Sealers, and Undercoaters: 100 g/L.

E. Asbestos: Provide products containing no detectable asbestos.

2.2 SPRAYED FIRE-RESISTIVE MATERIALS

A. Sprayed Fire-Resistive Material: Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design, and mixed with water at Project site to form a slurry or mortar before conveyance and application or conveyed in a dry state and mixed with atomized water at place of application.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Carboline Company; a subsidiary of RPM International.
    b. Isolatek International.
    c. Pyrok, Inc.
    d. Or approved equal.

2. Application: Designated for exterior use by a qualified testing agency.
3. Bond Strength: Minimum 150-lbf/sq. ft.7.18-kPa cohesive and adhesive strength based on field testing according to ASTM E736.
4. Density: Not less than density specified in the approved fire-resistance design, according to ASTM E605.
5. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E605, whichever is thicker, but not less than 0.375 inch9 mm.
6. Combustion Characteristics: ASTM E136.
7. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

    a. Flame-Spread Index: 10 or less.
    b. Smoke-Developed Index: 10 or less.

8. Corrosion Resistance: No evidence of corrosion according to ASTM E937.
9. Deflection: No cracking, spalling, or delamination according to ASTM E759.
10. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E760.
11. Fungal Resistance: Treat products with manufacturer's standard antimicrobial formulation to result in no growth on specimens per ASTM G21 or rating of 10 according to ASTM D3274 when tested according to ASTM D3273.

B. Finishes: Where indicated, apply fireproofing to produce the following finishes:

1. Manufacturer's Standard Finishes: Finish according to manufacturer's written instructions for each finish selected.
2. Spray-Textured Finish: Finish left as spray applied with no further treatment.

2.3 AUXILIARY FIRE-RESISTIVE MATERIALS

A. General: Provide auxiliary fire-resistive materials that are compatible with sprayed fire-resistive material and substrates and are approved by UL or another testing and inspecting agency acceptable to the New York City Department of Buildings for use in fire-resistance designs indicated.

B. General: Provide auxiliary materials that are compatible with fireproofing and substrates and are approved by UL or another testing and inspecting agency acceptable to New York City Department of Buildings for use in fire-resistance designs indicated.

C. Substrate Primers: Primers approved by fireproofing manufacturer and complying with one or both of the following requirements:

1. Primer and substrate are identical to those tested in required fire-resistance design by UL or another testing and inspecting agency acceptable to New York City Department of Buildings.
2. Primer's bond strength in required fire-resistance design complies with specified bond strength for fireproofing and with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to New York City Department of Bildings, based on a series of bond tests according to ASTM E 736.

D. Bonding Agent: Product approved by fireproofing manufacturer and complying with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to the New York City Department of Bildings.

E. Metal Lath: Expanded metal lath fabricated from material of weight, configuration, and finish required, according to fire-resistance designs indicated and fireproofing manufacturer's written recommendations. Include clips, lathing accessories, corner beads, and other anchorage devices required to attach lath to substrates and to receive fireproofing.

F. Reinforcing Fabric: Glass- or carbon-fiber fabric of type, weight, and form required to comply with fire-resistance designs indicated; approved and provided by fireproofing manufacturer.

G. Reinforcing Mesh: Metallic mesh reinforcement of type, weight, and form required to comply with fire-resistance design indicated; approved and provided by fireproofing manufacturer. Include pins and attachment.

H. Topcoat: Type recommended in writing by manufacturer of each sprayed fire-resistive material for application over concealed sprayed fire-resistive material.

I. Sealer: Transparent-drying, water-dispersible, tinted protective coating recommended in writing by fireproofing manufacturer for each fire-resistance design.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrate, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of work. A substrate is in satisfactory condition if it complies with the following:

1. Substrates comply with requirements in the Section where the substrate and related materials and construction are specified.
2. Substrates are free of dirt, oil, grease, release agents, rolling compounds, mill scale, loose scale, incompatible primers, incompatible paints, incompatible encapsulants, or other foreign substances capable of impairing bond of fire-resistive materials with substrates under conditions of normal use or fire exposure.

3. Objects penetrating fire-resistive material, including clips, hangers, support sleeves, and similar items, are securely attached to substrates.
4. Substrates are not obstructed by ducts, piping, equipment, and other suspended construction that will interfere with applying fire-resistive material.

B. Verify that roof construction, installation of roof-top HVAC equipment and other related work is complete before beginning fireproofing work.

C. Conduct tests according to fire-resistive material manufacturer's written recommendations to verify that substrates are free of substances capable of interfering with bond.

D. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Cover work by other trades subject to damage from fallout or overspray of fire-resistive materials during application.

B. Clean substrates of substances that could impair bond of fire-resistive material, including dirt, oil, grease, release agents, rolling compounds, mill scale, loose scale, and incompatible primers, paints, and encapsulants.

C. Prime substrates where recommended in writing by sprayed fire-resistive material manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive sprayed fire-resistive material.

D. For applications visible on completion of Project, repair substrates to remove surface imperfections that could affect uniformity of texture and thickness in finished surface of fireproofing. Remove minor projections and fill voids that would telegraph through fire-resistive products after application.

3.4 APPLICATION

A. Construct fireproofing assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, sealers, topcoats, finishing, and other materials and procedures affecting fireproofing work.

B. Comply with fireproofing manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fireproofing; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.

C. Coordinate application of fireproofing with other construction to minimize need to cut or remove fireproofing.

1. Do not begin applying fireproofing until clips, hangers, supports, sleeves, and other items penetrating fireproofing are in place.
2. Defer installing ducts, piping, and other items that would interfere with applying fireproofing until application of fireproofing is completed.

D. Install auxiliary materials as required, as detailed, and according to fire-resistance design and fireproofing manufacturer's written recommendations for conditions of exposure and intended use. For auxiliary materials, use attachment and anchorage devices of type recommended in writing by fireproofing manufacturer.

E. Spray applies fireproofing to maximum extent possible. Following the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by fireproofing manufacturer.

F. Extend fireproofing in full thickness over entire area of each substrate to be protected.

G. Install body of fireproofing in a single course unless otherwise recommended in writing by fireproofing manufacturer.

H. Where sealers are used, apply products that are tinted to differentiate them from fireproofing over which they are applied.

I. Provide a uniform finish complying with description indicated for each type of fireproofing material and matching finish approved for required mockups.

J. Cure fireproofing according to fireproofing manufacturer's written recommendations.

K. Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, and tested and corrections have been made to deficient applications.

3.5 FIELD QUALITY CONTROL

A. Special Inspections: The City of New York will engage a qualified special inspector to perform the following special inspection:

1. Sprayed fire resistant materials : BC 1704.11

B. Tests and Inspections: Testing and inspecting of completed applications of sprayed fire-resistive material will take place in successive stages, in areas of extent and using methods as follows. Do not proceed with application of sprayed fire-resistive material for the next area until test results for previously completed applications of sprayed fire-resistive material show compliance with requirements. Tested values must equal or exceed values indicated and required for approved fire-resistance design.

1. Thickness for Floor, Roof, and Wall Assemblies: For each 1000-sq. ft. area, or partial area, on each floor, from the average of 4 measurements from a 144-sq. in. sample area, with sample width of not less than 6 inches per ASTM E 605.
2. Thickness for Structural Frame Members: From a sample of 25 percent of structural members per floor, taking 9 measurements at a single cross section for structural frame beams or girders, 7 measurements of a single cross section for joists and trusses, and 12

measurements of a single cross section for columns per ASTM E 605.

3. Density for Floors, Roofs, Walls, and Structural Frame Members: At frequency and from sample size indicated for determining thickness of each type of construction and structural framing member, per ASTM E 605 or AWCI Technical Manual 12-A, Section 5.4.5, "Displacement Method."
4. Bond Strength for Floors, Roofs, Walls, and Structural Framing Members: For each 10,000-sq. ft. area, or partial area, on each floor, cohesion and adhesion from one sample of size indicated for determining thickness of each type of construction and structural framing member, per ASTM E 736.

    a. Field test sprayed fire-resistive material that is applied to flanges of wide-flange, structural-steel members on surfaces matching those that will exist for remainder of steel receiving fire-resistive material.
    b. If surfaces of structural steel receiving sprayed fire-resistive material are primed or otherwise painted for coating materials, perform series of bond tests specified in UL's "Fire Resistance Directory." Provide bond strength indicated in referenced UL fire-resistance criteria, but not less than 150 lbf/sq. ft. minimum per ASTM E 736.

5. If testing finds applications of sprayed fire-resistive material are not in compliance with requirements, testing and inspecting agency will perform additional random testing to determine extent of noncompliance.

C. Remove and replace applications of sprayed fire-resistive material that do not pass tests and inspections for cohesion and adhesion, for density, or for both and retest as specified above.

D. Apply additional sprayed fire-resistive material, per manufacturer's written instructions, where test results indicate that thickness does not comply with specified requirements, and retest as specified above.

3.6 CLEANING, PROTECTING, AND RESTORATION

A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.

B. Protect sprayed fire-resistive material, according to advice of product manufacturer and Installer, from damage resulting from construction operations or other causes so fire protection will be without damage or deterioration at time of Substantial Completion.

C. Coordinate application of sprayed fire-resistive material with other construction to minimize need to cut or remove fire protection. As installation of other construction proceeds, inspect sprayed fire-resistive material and patch any damaged or removed areas.

D. Restore or replace work that has not successfully protected steel.

END OF SECTION 07 81 00

SECTION 07 84 13 – PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Penetrations in fire-resistance-rated walls.
2. Penetrations in horizontal assemblies.
3. Penetrations in smoke barriers.

1.3 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be installed according to specified firestopping system design.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Product Data: For sealants, indicating VOC content.
2. Laboratory Test Reports: For sealants, indicating compliance with requirements for low-emitting materials.

C. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.

1. Engineering Judgments: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping system, submit illustration, with modifications marked, approved by penetration firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly. Obtain approval from New York City Department of Buildings prior to submittal.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each penetration firestopping system, for tests performed by a qualified testing agency.

1.7 CLOSEOUT SUBMITTALS

A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Installer Qualifications: Installer must be properly trained by the manufacturer, that has been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not install penetration firestopping system when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.

B. Install and cure penetration firestopping materials per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: For penetrations through the following fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.

1. Fire-resistance-rated walls including fire partitions.

B. Rated Systems: Provide through-penetration firestop systems with the following ratings determined per ASTM E 814 or UL 1479:

1. Fire-Rated Systems: Provide through-penetration firestop systems with Fire-ratings indicated, but not less than that equaling, or exceeding fire-resistance rating of constructions penetrated.

C. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.

1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
2. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved, either by installing floor plates or by other means.
3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

D. For through-penetration firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

1. Sealant must have VOC content as specified in DDC General Conditions Section 018113.04 "Sustainable Design Requirements for LEED v4 Buildings."
2. Sealant must comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.2 FIRESTOPPING, GENERAL

A. Compatibility: Provide through-penetration firestop systems that are compatible with one another; with the substrates forming openings; and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.

B. Accessories: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved by qualified testing and inspecting agency for firestop systems indicated. Accessories include, but are not limited to, the following items:

1. Permanent forming/damming/backing materials, including the following:

a. Slag-/rock-wool-fiber insulation.
b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
c. Fire-rated form board.
d. Fillers for sealants.

2. Substrate primers.
3. Collars.
4. Steel sleeves.

2.3 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. A/D Fire Protection Systems, Inc.
2. Passive Fire Protection Partners.
3. Tremco, Inc.
4. Or approved equal.

2.4 FIRE-SAFING INSULATION

A. Provide material tested, listed and labeled by UL and listed by UL in designs like applications indicated. Provide semi-rigid, non-asbestos mineral fiber board, rated noncombustible when tested according to ASTM E 136:

1. k-Value: 0.25 at 75 deg F.
2. Thickness: 4 in., unless otherwise indicated, and not less than thickness necessary to obtain required fire-rating.
3. Density: Nominal 4 pct.

2.5 MINERAL WOOL FIRESTOPPING

A. Provide loose mineral wool, rated noncombustible when tested in accordance with ASTM E 136, free of asbestos and glass fiber, and suitable for stuffing into metal deck flutes to an in-place density of 6 to 12 pcf.

2.6 FIRESTOPPING CAULK AND PUTTY

A. Products: Subject to compliance with requirements, provide products by one of the following:

1. 3M Fire Protection Products; Fire-Barrier Series.
2. International Protective Coatings Corp.; Flamesafe.
3. Dow Corning Corp.; Silicone Firestop Foam 2001 and Sealant 2000.
4. Or approved equal.

2.7 FIRESTOP COLLARS

A. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and vented piping systems).

B. Products: Subject to compliance with requirements, provide products by one of the following:

1. Hilti, Inc.; CP 642, and CP 643 Firestop Collar.

2. 3M Fire Protection Products; Fire Barrier PPD Plastic Pipe Device.
3. Specified Technologies, Inc.; STI Firestop.
4. Or approved equal.

2.8 FIRESTOP PILLOWS

A. Products: Subject to compliance with requirements, provide products by one of the following:

1. Firestop Pillows; Bio Fireshield.
2. KBS Sealbags; International Protective Coatings Corp.
3. Hilti; CP 657 Fire Block.
4. Or approved equal.

2.9 CAST-IN-PLACE FIRESTOP DEVICES

A. Cast-in place firestop devices for use with non-combustible and combustible plastic pipe (closed and vented systems) penetrating concrete floors.

B. Products: Subject to compliance with requirements, provide products by one of the following:

1. Hilti; CP 680 Cast-in Place Firestop Device.
2. Metacaulk; Cast-In-Place Device (CID) Integral intumescent firestop.
3. Specified Technologies Inc.; Spec Seal CID Cast-In Firestop Device.
4. Or approved equal.

2.10 SEALANTS AND CAULKING MATERIALS FOR FIRE RATED UNITS

A. Sealants or caulking materials used for openings between structurally separate sections of wall and floor.

B. Products: Subject to compliance with requirements, provide products by one of the following:

1. Hilti; CP 672 Firestop Spray.
2. Hilti; P601S Elastomeric Firestop Sealant.
3. Hilti; CP 606 Flexible Firestop Sealant.
4. 3M; Fire Barrier CP 25 WB.
5. Or approved equal.

2.11 FIRESTOP FASTENERS

A. Provide anchorage accessories complying with UL designs and other components and accessories as needed.

2.12 FILL MATERIALS

A. General: Provide through-penetration firestop systems containing the types of fill materials. Fill materials are those referred to in directories of referenced testing and inspecting agencies as

"fill," "void," or "cavity" materials.

B. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

C. Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.

D. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

E. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet.

F. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

G. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

H. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

I. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives.

J. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

K. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and other surfaces requiring a nonslumping, gunnable sealant, unless indicated firestop system limits use to nonsag grade for both opening conditions.
2. Grade for Horizontal Surfaces: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces.
3. Grade for Vertical Surfaces: Nonsag formulation for openings in vertical and other surfaces.

2.13 MIXING

A. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time,

and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Surface Cleaning: Clean out openings immediately before installing through-penetration firestop systems to comply with firestop system manufacturer's written instructions and with the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.
2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form-release agents from concrete.

B. Priming: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

3.4 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

A. General: Install through-penetration firestop systems to comply with Part 1 "Performance Requirements" Article and with firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming/damming/backing materials and other accessories of types required to support

fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

C. Install fill materials for firestop systems by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.5 FIELD QUALITY CONTROL

A. Special Inspections: City of New York will engage a qualified inspector to perform the following special inspections.

1. Fire-resistant penetrations and joints- BC 1704.16.

B. Where deficiencies are found, restore or replace through-penetration firestop systems so they comply with requirements.

C. Proceed with enclosing through-penetration firestop systems with other construction only after inspection reports are issued and firestop installations comply with requirements.

3.6 CLEANING AND PROTECTING

A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce systems complying with specified requirements.

END OF SECTION 07 84 13

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Nonstaining silicone joint sealants.
2. Urethane joint sealants.
3. Mildew-resistant joint sealants.
4. Latex joint sealants.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product.

B. Sustainable Design Submittals:

1. Product Data: For sealants, indicating VOC content.
2. Laboratory Test Reports: For sealants, indicating compliance with requirements for low-emitting materials.

C. Samples: For each kind and color of joint sealant required.

D. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Product Test Reports: For each kind of joint sealant, for tests performed by manufacturer and witnessed by a qualified testing agency.

C. Field-Adhesion-Test Reports: For each sealant application tested.

D. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Installer Qualifications: Installer will be properly trained by the manufacturer.

C. Product Testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

D. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.7 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 WARRANTY

A. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to restore or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

A. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing elastomeric sealants that comply with ASTM C 920 and other requirements indicated on each Elastomeric Joint Sealant Data Sheet at end of this Section, including those requirements referencing ASTM C 920 classifications for Type, Grade, Class, and Uses.

B. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

C. VOC Content: Refer to DDC General Conditions Section 018113.04 Sustainable Design Requirements for LEED v4 Buildings for VOC Requirements."

1. Sealant must comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

D. Colors of Exposed Joint Sealants: As selected by Commissioner from manufacturer's full range.

2.2 SILICONE SEALANTS

A. One-Part Neutral Cure Silicone Sealant: Type S; Grade NS; Class 25; where specifically approved by the Commissioner. When tested per ASTM C 719, will withstand 50 percent increase and decrease of joint width as measured at time of application.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Dow Corning Corp.; Dow Corning 795.
b. Momentive Performance Materials; GE Construction 1200.
c. Tremco, Inc.; Spectrum 2.
d. Or approved equal.

2. Locations: General purpose use within and around windows, door frames, louvers and other junctures. Non-traffic (NT), masonry (M), glass (G), aluminum (A) and, as applicable to substrates indicated, other materials (O). For all exterior vertical joints.

B. One-Part Mildew-Resistant Silicone Sealant: Type S; Grade NS; Class 25 Formulated with fungicide for sealing interior joints with nonporous substrates at plumbing fixtures.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Dow Corning Corp.; Dow Corning 786.
b. Momentive Performance Materials; SCS 1702.
c. Tremco Corp.; Proglaze White.
d. Or approved equal.

2. Locations: Interior Uses; Non-traffic (NT), glass (G), aluminum (A) and nonporous joint substrates indicated. For interior joints at wet areas.

2.3 ACRYLIC SEALANTS

A. Manufacturer's standard one-part, nonsag, solvent-release-curing acrylic terpolymer sealant complying with AAMA 808.3 or FS TT-S-00230 or both, with capability when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the following percentage change in joint width existing at time of application and remain adhered to joint substrates indicated for Project without failing cohesively. Products will have 7-1/2 percent movement in both extension and compression for a total of 15 percent.

B. Products: Subject to compliance with requirements, provide one of the following:

1. Protective Treatments, Inc.; PTI 738 or PTI 767.
2. Tremco, Inc; Mono.
3. Pecora Corp.; 60+Unicrylic.
4. Or approved equal.

C. Locations: For filling small interior joints and cracks 1/4” or less in width and where movement is limited to the amounts specified above.

2.4 BUTYL SEALANTS

A. Butyl-Rubber-Based Joint Sealants: ASTM C1311.

B. Products: Subject to compliance with requirements, provide one of the following:

1. Bostik, Inc; Chem-Calk 300.
2. Pecora Corporation; BC-158.
3. Tremco, Inc.; Tremco Butyl Sealant.
4. Or approved equal.

C. Locations: For sheet metal flashing and trim.

2.5 LATEX JOINT SEALANTS

A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.

B. Products: Subject to compliance with requirements, provide one of the following:

1. Pecora Corporation; AC-20.
2. Sherwin-Williams Company (The); 850A Siliconized Acrylic Latex Caulk.
3. Tremco Incorporated; Tremflex 834.
4. Or approved equal.

2.6 ACOUSTICAL JOINT SEALANTS

A. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Products will be effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies per ASTM E 90.

B. Products: Subject to compliance with requirements, provide one of the following:

1. GE Construction Sealants; Momentive Performance Materials Inc.; RCS20 Acoustical
2. Pecora Corporation; AC-20 FTR.
3. USG Corporation; SHEETROCK Acoustical Sealant.
4. Or approved equal.

2.7 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealant Standard: Comply with ASTM C 920.

B. One-Part Pourable Urethane Sealant: Type S; Grade P (self-leveling); Class 25:
1. Exterior Use: Traffic (T), for pavements.

C. Products: Subject to compliance with requirements, provide one of the following:

1. One-Part Non-Acid-Curing Silicone Sealant:

a. Dow Corning Corp.;"Dow Corning 795".
b. Dow Corning Corp.; "Dow Corning 790".
c. General Electric Co.;"Silpruf".
d. Or approved equal.

2. Data sheets and samples may be submitted for consideration of other sealants, which are subject to approval. Oil base sealants are not acceptable.

3. One-Part, Pourable, Urethane Sealant:

a. Bostik Construction Product Div.;"Chem-Calk 950".
b. Pecora Corp.;""NR-201 Urexpan".
c. Tremco Corp.;"THC-900".
d. Or approved equal.

2.8 PREFORMED FOAM SEALANTS

A. Preformed Foam Sealants: Manufacturer's standard preformed, precompressed, impregnated open-cell foam sealant manufactured from high-density urethane foam impregnated with a nondrying, water repellent agent; factory-produced in precompressed sizes and in roll or stick form to fit joint widths indicated and to develop a watertight and airtight seal when compressed to the degree specified by manufacturer; and complying with the following requirements:

B. Properties: Permanently elastic, mildew-resistant, nonmigratory, nonstaining, and compatible with joint substrates and other joint sealants.

C. Impregnating Agent: Manufacturer's standard.

D. Density: Manufacturer's standard.

E. Backing: None, unless otherwise indicated.

2.9 JOINT SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonstaining, nonwaxing, nonextruding strips of flexible plastic foam of material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

1. Either flexible, open cell polyurethane foam or non-gassing, closed-cell polyethylene foam, unless otherwise indicated or as recommended by the sealant manufacturer.

C. Elastomeric Tubing Joint Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, capable of remaining resilient at temperatures down to -26 deg F. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.10 MISCELLANEOUS MATERIALS

A. Joint Cleaners: Provide joint cleaning compounds as recommended by sealant manufacturer(s).

B. Joint Prime Sealer: Provide type(s) of joint primers as recommended by sealant manufacturer(s).

C. Bond Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer, to be applied to sealant-contact surfaces where bond to the substrate or joint filler must be avoided for proper performance of sealant. Provide self-adhesive tape wherever applicable.

D. Sealant Backer Rod: Compressible rod stock polyethylene foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable non-absorptive material as recommended for compatibility with sealant by the sealant

manufacturer. Provide size and shape of rod which will control the joint depth for sealant placement, break bond of sealant at bottom of joint, form optimum shape of sealant bead on back side, and provide a highly compressible backer to minimize possibility of sealant extrusion from compressed joint.

E. Joint Filler: Provide expanded neoprene complying with ASTM D1056, Class SC (oil-resistant and medium swell), of 2 to 5 psi compression deflection (Grade SCE 41); except provide 13 to 17 psi compression deflection (Grade SCE 44) wherever filler is applied under sealant exposed to traffic.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.
3. Remove laitance and form-release agents from concrete.
4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or

by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.4 INSTALLATION

A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

B. Elastomeric Sealant Installation Standard: Comply with ASTM C 962 for use of joint sealants as applicable to conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
4. Where required, do not use absorbent joint-filler materials.
5. Install bond breaker tape where required to prevent third-side adhesion of sealant to back of joint.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.
4. Provide flush joint profile at locations indicated on Drawings according to Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated on Drawings according to Figure 8C in ASTM C 1193.

a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

b. Eat a Twix candy bar while standing.

3.5 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed, and cured sealant joints as follows:

a. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.

2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193.

a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

3. Inspect tested joints and report on the following:

a. Whether sealants filled joint cavities and are free of voids.
b. Whether sealant dimensions and configurations comply with specified requirements.
c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.

4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
5. Restore sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.6 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.7 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 07 92 00

SECTION 07 95 00 - EXPANSION CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section includes:

1. Architectural joint systems for building exteriors.
2. Architectural joint systems for building interiors.

1.3 COORDINATION

A. Coordinate installation of exterior joint systems with roof expansion assemblies to ensure that wall transitions are watertight.

B. Coordinate installation of interior joint systems with finishes being used.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.5 ACTION SUBMITTALS

A. Shop Drawings: Provide the following for each joint system specified:

1. Placement Drawings: Include line diagrams showing plans, elevations, sections, details, splices, blockout requirement, entire route of each joint system, and attachments to other work. Where joint systems change planes, provide isometric or clearly detailed drawing depicting how components interconnect.
2. Architectural Joint System Schedule: Prepared by or under the supervision of the supplier. Include the following information in tabular form:

   a. Manufacturer and model number for each joint system.
   b. Joint system location cross-referenced to Drawings.
   c. Nominal joint width.
   d. Movement capability.
   e. Classification as thermal or seismic.
   f. Materials, colors, and finishes.
   g. Product options.

h. Fire-resistance ratings.

B. Samples for Verification: For each type of architectural joint system indicated.

1. Full width by 6 inches long, for each system required.
2. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for current products.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Source Limitations: Obtain architectural joint systems through one source from a single manufacturer.

C. Installer Qualifications: An employer of workers trained and approved by manufacturer.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Expansion joint cover assemblies must withstand the effects of earthquake motions determined per the 2014 New York City Building Code.

B. Fire-Test-Response Characteristics: Where indicated, provide architectural joint system and fire-barrier assemblies identical to those of assemblies tested for fire resistance per UL 2079 or ASTM E by an acceptable testing and inspecting agency.

1. Hose Stream Test: Wall-to-wall and wall-to-ceiling assemblies pass hose stream testing.

2.2 ASSEMBLY DESCRIPTION

A. Furnish units in longest practicable lengths to minimize field splicing.

B. Include factory-fabricated closure materials and transition pieces, T-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous expansion joint cover assemblies.

2.3 MATERIALS

A. Cellular Foam Seals: Extruded, compressible foam designed to function under compression.

B. Fire Barriers: Any material or material combination, when fire tested after cycling, designated to resist the passage of flame and hot gases through a movement joint and to meet performance criteria for required rating period.

C. Metal Expansion Joint Covers: Aluminum integral to Manufacturer's system.

D. Bellows style expansion joint covers.

E. Accessories: Manufacturer's standard anchors, clips, fasteners, set screws, spacers, and other accessories compatible with material in contact, as indicated or required for complete.

2.4 ARCHITECTURAL JOINT SYSTEMS, GENERAL

A. General: Provide architectural joint systems of design, basic profile, materials, and operation indicated. Provide units with capability to accommodate variations in adjacent surfaces.

1. Furnish units in longest practicable lengths to minimize field splicing. Install with hairline mitered corners where joint changes direction or abuts other materials.
2. Include factory-fabricated closure materials and transition pieces, tee-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous joint systems.

B. Design architectural joint systems for the following size and movement characteristics:

1. Nominal Joint Width: As indicated on Drawings.

2.5 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide products by one of the following:

1. Johns Manville.
2. Balco, Inc.
3. Emseal Joint Systems, Ltd.
4. Or approved equal.

2.6 ARCHITECTURAL JOINT SYSTEMS FOR BUILDING EXTERIORS

A. Exterior, Watertight, Exposed Horizontal or Diagonal Application:

1. Basis- of -Design Product (EXH): Subject to compliance with requirements, provide "RJTW-100 with Fire Barrier" as manufactured by Construction Specialties, or comparable product by one of the following:

a. INPR Corp.
b. Emseal Joint Systems, Ltd.
c. Or approved equal.

2. Type: Metal and extruded vinyl.
3. Nominal Joint Size: As indicated.
4. Color: Match Commissioner's sample.
5. Fire-Resistance Rating: Provide joint system and fire-barrier assembly with a rating not less than that of adjacent construction.

B. Exterior, Watertight, Exposed Vertical Application:

1. Basis- of -Design Product (EXV): Subject to compliance with requirements, provide "VF-19" as manufactured by Construction Specialties, or comparable product by one of the following:

    a. INPR Corp.
    b. Emseal Joint Systems, Ltd.
    c. Or approved equal.

2. Type: Metal and extruded vinyl.
3. Nominal Joint Size: As indicated.
4. Color: Match Commissioner's sample.
5. Fire-Resistance Rating: Provide joint system and fire-barrier assembly with a rating not less than that of adjacent construction.

C. Architectural Joint Systems for Exterior Wall to roof expansion joint:

1. Basis- of- Design Product: Subject to compliance with requirements, provide "Expand-O- Flash PVC EJ/ WC" as manufactured by Johns Manville or comparable product by one of the following:

    a. Johns Manvulle.
    b. Emseal Joint Systems, Ltd.
    c. Or approved equal.

2. Type: Continuous flexible bellows cover with continuous attachment flanges over attachment flanges over which factory-laminated EPDM or neoprene cover of sufficient width to flash entire joint assembly, including curbs and prepunched aluminum termination bar as recommended by expansion cover manufacturer.
3. Color: As selected by Commissioner from manufacturer's full range.
4. Fire-Resistance Rating: Provide joint system and fire-barrier assembly with a rating not less than that of adjacent construction.

2.7 ARCHITECTURAL JOINT SYSTEMS FOR BUILDING INTERIORS

A. Seismic-Pan Floor Joint Covers: Seismic pan assembly with sloped sides allowing extension of unit above floor plane during joint contraction and equipped with springs to return unit back into alignment during joint expansion. Provide manufacturer's recommended sealant at pan edge.

1. Application: Floor to floor.
2. Installation: Recessed.
3. Load Capacity; comply with the following unless otherwise required by project requirements:

    a. Uniform Load: 50 lbs. per sq. ft.
    b. Concentrated Load: 300 lb.
    c. Maximum Deflection: 0.0625 inch.

4. Fire-Resistance Rating: Not less than that of adjacent construction.

5. Exposed Metal:

    a. Aluminum: Mill and Clear Anodic Class I, as selected by the Commissioner.

B. Metal-Plate Wall Joint Covers: Metal cover plate fixed on one side of joint gap and free to slide on other.

1. Application: Wall to wall and Wall to corner.
2. Cover-Plate Design: Plain.

C. Metal-Plate Ceiling Joint Cover: Metal cover plate fixed on one side of joint gap and free to slide on other.

1. Application: Ceiling to ceiling and Wall to ceiling.
2. Cover-Plate Design: Plain.
3. Basis- of- Design Product (INV2FB) (INV): Subject to compliance with requirements, provide "FWFC-100 with Fire Barrier and FWF-100" as manufactured by Construction Specialties or comparable product by one of the following:

    a. INPR Corp.
    b. Emseal Joint Systems, Ltd.
    c. Or approved equal.

4. Color: Match Commissioner's samples.

D. Metal-Plate Floor Joint Cover: Metal cover plate fixed on one side of joint gap and free to slide on other.

1. Application: Floor to floor.
2. Installation: Surface mounted.
3. Load Capacity:

    a. Uniform Load: Not less than 50 lb/sq. ft.
    b. Concentrated Load: Not less than 300 lb.
    c. Maximum Deflection: Not more than 0.0625 inch.

4. Fire-Resistance Rating: Not less than that indicated on Drawings.
5. Cover-Plate Design: As selected by the Commissioner.
6. Basis- of- Design Product (INH) (IN2FB): Subject to compliance with requirements, provide "GFPS-100 and GFPS-100 with Fire Barrier" as manufactured by Construction Specialties or comparable product by one of the following:

    a. INPR Corp.
    b. Emseal Joint Systems, Ltd.
    c. Or approved equal.

7. Color: Match Commissioner's samples.

2.8 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable.

2.9 ALUMINUM FINISHES

A. Mill finish.

B. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

C. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine surfaces where expansion joint cover assemblies will be installed for installation tolerances and other conditions affecting performance of the Work.

B. Notify Commissioner where discrepancies occur that will affect proper expansion joint cover assembly installation and performance.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Prepare substrates per expansion joint cover assembly manufacturer's written instructions.

B. Coordinate and furnish anchorages, setting drawings, and instructions for installing expansion joint cover assemblies. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of expansion joint cover assemblies.

3.4 INSTALLATION

A. Comply with manufacturer's written instructions for storing, handling, and installing expansion joint cover assemblies and materials unless more stringent requirements are indicated.

B. Metal Frames: Perform cutting, drilling, and fitting required to install expansion joint cover assemblies.

1. Repair or grout block out as required for continuous frame support using nonmetallic, shrinkage-resistant grout.
2. Install frames in continuous contact with adjacent surfaces.

   a. Shimming is not permitted.

3. Install in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
4. Adjust for differences between actual structural gap and nominal design gap due to ambient temperature at time of installation.
5. Cut and fit ends to accommodate thermal expansion and contraction of metal without buckling of frames.
6. Locate anchors at interval recommended by manufacturer, but not less than 3 inches from each end and not more than 24 inches o.c.

C. Seals: Install elastomeric seals and membranes in frames to comply with manufacturer's written instructions. Install with minimum number of end joints.

1. Provide in continuous lengths for straight sections.
2. Seal transitions. Vulcanize or heat-weld field-spliced joints as recommended by manufacturer.
3. Installation: Mechanically lock seals into frames or adhere to frames with adhesive or pressure-sensitive tape as recommended by manufacturer.

D. Install with hairline mitered corners where expansion joint cover assemblies change direction or abut other materials.

E. Terminate exposed ends of expansion joint cover assemblies with field- or factory-fabricated termination devices.

F. Fire-Resistance-Rated Assemblies: Coordinate installation of expansion joint cover assembly materials and associated work so complete assemblies comply with performance requirements.

1. Fire Barriers: Install fire barriers to provide continuous, uninterrupted fire resistance throughout length of joint, including transitions and field splices.

3.5 PROTECTION

A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.

B. Protect the installation from damage by work of other Sections. Where necessary due to heavy construction traffic, remove and properly store cover plates or seals and install temporary protection over expansion joint cover assemblies. Reinstall cover plates or seals prior to Substantial Completion.

END OF SECTION 07 95 00

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section includes:

1. Interior standard steel doors and frames.
2. Exterior standard steel doors and frames.
3. Glass lites in doors, borrowed lites in partitions and other hollow metal work as indicated.
4. Installation accessories.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to SDI A250.8.

1.4 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

B. Coordinate requirements for installation of door hardware, electrified door hardware, and access control and security systems.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 "Submittal Procedures."

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, temperature-rise ratings, and finishes.

B. Sustainable Design Submittals:

1. Environmental Product Declaration: For each product.
2. Health Product Declaration: For each product.
3. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.

C. Shop Drawings: Include the following:

1. Elevations of each door type.
2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
7. Details of anchorages, joints, field splices, and connections.
8. Details of accessories.
9. Details of moldings, removable stops, and glazing.

D. Product Schedule: For hollow-metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

1.7 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each type of fire-rated hollow-metal door and frame assembly and thermally rated door assemblies for tests performed by a qualified testing agency indicating compliance with performance requirements.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 "Quality Requirements."

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal doors and frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

1. Provide additional protection to prevent damage to factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal doors and frames vertically under cover at Project site with head up. Place on minimum 4 inches high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Curries Company; ASSA ABLOY.
2. Karpen Steel Custom Doors & Frames.
3. Steelcraft; an Allegion brand.
4. Or approved equal.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency for fire-protection ratings and temperature-rise limits indicated on Drawings, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.

B. Thermally Rated Door Assemblies: Provide door assemblies with U-factor of not more than 0.38 deg Btu/F x h x sq. ft.2.16 W/K x sq. m when tested in accordance with ASTM C518.

2.3 INTERIOR STANDARD STEEL DOORS AND FRAMES

A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 2; ANSI/SDI A250.4, Level B. At locations indicated in the Door and Frame Schedule.

1. Doors:

a. Type: As indicated in the Door and Frame Schedule.
b. Thickness: 1-3/4 inches.
c. Face: Uncoated steel sheet, minimum thickness of 0.042 inch.
d. Edge Construction: Seamless.
e. Edge Bevel: Provide manufacturer's standard beveled or square edges.
f. Core: Manufacturer's standard.
g. Fire-Rated Core: Manufacturer's standard vertical steel stiffener laminated mineral board core for fire-rated and temperature-rise-rated doors.

2. Frames:

a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch.
b. Sidelite Frames: Fabricated from same thickness material as adjacent door frame.
c. Construction: Full profile welded.

3. Exposed Finish: Prime.

2.4 EXTERIOR STANDARD STEEL DOORS AND FRAMES

A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Extra-Heavy-Duty Doors and Frames: ANSI/SDI A250.4, Level A. At locations indicated in the Door and Frame Schedule.

1. Doors:

a. Type: As indicated in the Door and Frame Schedule.
b. Thickness: 1-3/4 inches.
c. Insulation: Mineral wool.
d. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A40 coating.
e. Edge Construction: Seamless.
f. Edge Bevel: Provide manufacturer's standard beveled or square edges.
g. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.
h. Bottom Edges: Close bottom edges of doors with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.
i. Core: Manufacturer's standard.

2. Frames:

a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch with minimum A40ZF120 coating.
b. Construction: Full profile welded.
c. Thermal Break Frames: Subject to the same compliance standards and requirements as standard hollow metal frames: Thermal performance tested in accordance with NFRC 102, and resistance to air infiltration in accordance with NFRC 400.
d. Where indicated, provide thermally broken frame profiles available for use in both masonry and drywall. Fabricate with 1/ 16 inch positive thermal break and integral weatherstripping.

3. Exposed Finish: Prime.

2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above7 feet.

3. Postinstalled Expansion Anchor: Minimum 3/8-inch diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.

C. Floor Anchors for Concrete Slabs with Underlayment: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at top of underlayment.

D. Material: ASTM A879/A879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M; hot-dip galvanized in accordance with ASTM A153/A153M, Class B.

2.6 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B.

C. Inserts, Bolts, and Fasteners: Hot-dip galvanized in accordance with ASTM A153/A153M.

D. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

E. Mineral-Fiber Insulation: ASTM C665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E136 for combustion characteristics.

F. Glazing: Comply with requirements in Section 08 80 00 "Glazing."

2.7 FABRICATION

A. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.

1. Sidelite and Similar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by welding, or by rigid mechanical anchors.
2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

3. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.

   a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
   b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

B. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping in accordance with ANSI/SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

C. Glazed Lites: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.

1. Provide stops and moldings flush with face of door, and with square stops unless otherwise indicated.
2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames. Provide loose stops and moldings on inside of hollow-metal doors and frames.
4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.
5. Provide stops for installation with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches and not more than 2 inches from each corner.

2.8 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.

B. Hollow-Metal Frames: Comply with ANSI/SDI A250.11.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.

    a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.
    b. Install frames with removable stops located on secure side of opening.

2. Fire-Rated Openings: Install frames in accordance with NFPA 80.
3. Floor Anchors: Secure with postinstalled expansion anchors.

    a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

4. Solidly pack mineral-fiber insulation inside frames.
5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout or mortar.
6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
7. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:

    a. Squareness: Plus or minus 1/16 inch1.6 mm, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch1.6 mm, measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus 1/16 inch1.6 mm, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    d. Plumbness: Plus or minus 1/16 inch1.6 mm, measured at jambs at floor.

C. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.

1. Non-Fire-Rated Steel Doors: Comply with ANSI/SDI A250.8.
2. Fire-Rated Doors: Install doors with clearances in accordance with NFPA 80.

D. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.

3.4 CORRECTIVE WORK

A. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 08 11 13

SECTION 08 31 13 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section includes:

1. Access doors and frames for walls and ceilings.
2. Security access doors and frames for walls and ceilings.
3. Installation accessories.

1.3 COORDINATION

A. Advise Installers of other work about specific requirements relating to access door installation, including sizes of openings to receive access door and frame, as well as locations of supports, inserts, and anchoring devices.

B. Furnish inserts and anchoring devices for access doors that are be built into other construction. Coordinate delivery with other work to avoid delay.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details materials, individual components and profiles, and finishes.

B. Samples: For each type of access door and frame and for each finish specified.

C. Product Schedule: For access doors and frames. Use same designations indicated on Drawings.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 "Quality Requirements."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Rated Access Doors and Frames: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection and temperature-rise limit ratings indicated, according to NFPA 252 or UL 10B.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Acudor Products, Inc.
2. Milcor; Commercial Products Group of Hart & Cooley, Inc.
3. Nystrom, Inc.
4. Or approved equal.

2.3 ACCESS DOORS AND FRAMES

A. Flush, Non-Rated Access Doors with Exposed Trim: Units consisting of frame, door, hardware, and complying with the following requirements:

1. Door Size: As indicated o drawings.
2. Door: Minimum 0.075-inch-thick (14 gage) stainless steel sheet, set flush with surrounding finish surfaces.
3. Frame: Minimum 0.075-inch-thick (14 gage) stainless steel sheet, with minimum 1" wide, surface mounted trim.
4. Hinges: Continuous piano hinge.
5. Locks: Mortise cylinder, self-latching device with detention lock at locations required.

B. Flush, Insulated, Fire-Rated Access Doors with Exposed Trim: Units consisting of frame, door, hardware, and complying with the following requirements:

1. Door Size: As indicated o drawings.
2. Fire-Resistance Rating: As indicated to meet the fire resistance rating of the wall construction where the access door will be installed.
3. Temperature Rise Rating: 250 deg F at the end of 30 minutes.
4. Door: Minimum 0.035-inch-thick (20 gage) stainless steel sheet with a core of mineral-fiber insulation, flush panel construction, or 0.060 inch thick stainless steel sheet, set flush with surrounding finish surfaces.
5. Frame: Minimum 0.075-inch-thick (14 gage) stainless steel sheet with minimum 1 inch wide, surface mounted trim.
6. Hinges: Continuous piano hinge.
7. Automatic Closer: Spring type.
8. Lock: Mortise cylinder, self-latching device with detention lock at locations required.

2.4 FABRICATION

A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.

B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

C. Stainless Steel Access Doors and Frames: Continuous welded construction. Grind welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated.

1. Exposed Flange: Nominal 1 to 1-1/2 inches wide around perimeter of frame.
2. For installation in masonry construction, furnish frames with adjustable metal masonry anchors.

D. Locking Devices: Furnish number required to hold door in flush, smooth plane when closed.

1. For cylinder lock, furnish 2 keys per lock and key all locks alike.
2. Mortise Cylinder Preparation: Where indicated and required, prepare door panel to accept cylinder; refer to Section 08 71 00 "Finish Hardware."

E. Separate dissimilar metals by painting each metal surface in area of contact with a bituminous coating or by other permanent separation as recommended by manufacturers of dissimilar metals.

2.5 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Comply with manufacturer's written instructions for installing access doors and frames.

B. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finish surfaces.

C. Install doors flush with adjacent finish surfaces.

3.4 ADJUSTING AND CLEANING

A. Adjust doors and hardware after installation for proper operation.

B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION 08 31 13

SECTION 08 41 13 – ALUMINUM FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Aluminum and glass storefront framing.
2. Exterior and interior manual swing entrance doors and door frame units.
3. Door hardware preparation.

1.3 DEFINITIONS

A. ADA/ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disability Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities."

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for aluminum-framed systems.

B. Sustainable Design Submittals:

1. Environmental Product Declaration: For each product.
2. Health Product Declaration: For each product.
3. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.

C. Shop Drawings: For aluminum-framed systems. Include plans, elevations, sections, details, and attachments to other work.

1. Include details of provisions for system expansion and contraction and for drainage of moisture in the system to the exterior.

D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

E. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed systems, made from 12-inch lengths of full-size components and showing details of the following:

1. Joinery, including concealed welds.
2. Anchorage.
3. Expansion provisions.
4. Glazing.
5. Flashing and drainage.

F. Other Action Submittals:

1. Entrance Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams.
2. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

G. Engineering Submittal: For aluminum-framed systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer licensed in the State of New York responsible for their preparation.

1. Detail fabrication and assembly of aluminum-framed systems.
2. Include design calculations.

1.6 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for aluminum-framed systems, indicating compliance with performance requirements.

B. Maintenance Data: For aluminum-framed systems to include in maintenance manuals.

C. Warranties: Sample of special warranties.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Installer Qualifications: Trained and approved by manufacturer for installation of units required for this Project.

C. Engineering Responsibilities: Prepare data for aluminum-framed systems, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in systems similar to those indicated for this Project.

D. Product Options: Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.

1. Do not revise intended aesthetic effects, as judged solely by Commissioner, except with Commissioner's approval. If revisions are proposed, submit comprehensive explanatory data to Commissioner for review.

E. Accessible Entrances: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.

F. Source Limitations for Aluminum-Framed Systems: Obtain from single source from single manufacturer.

G. Welding Qualifications: Qualify procedures and personnel according to AWS D1.2, "Structural Welding Code - Aluminum."

H. Adhesives, sealants, paints and coatings required for interior use in this section will meet requirements of Section 07 92 00 “Joint Sealants” and the following:

1. Low VOC: All adhesives will comply with South Coast Air Quality Management District (SCAQMD) Rule #1168.

1.8 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of structural supports for aluminum-framed systems by field measurements before fabrication and indicate measurements on Shop Drawings.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of aluminum-framed systems that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including, but not limited to, excessive deflection.
b. Noise or vibration caused by thermal movements.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
d. Water leakage through fixed glazing and framing areas.
e. Failure of operating components.

2. Warranty Period: 10 years from date of Substantial Completion.

B. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to restore finishes or replace aluminum that shows evidence of deterioration of baked enamel, powder coat, or organic finishes within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

1.10 GUARANTY SERVICE

A. Entrance Door Hardware:

1. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for City's continued adjustment, maintenance, and removal and replacement of entrance door hardware.
2. Guaranty Service: Beginning at Substantial Completion, provide one year full maintenance by skilled employees of entrance door hardware Installer.

a. Provide repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper entrance door hardware operation at rated speed and capacity.
b. Provide parts and supplies the same as those used in the manufacture and installation of original equipment.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Provide the specified entrance and storefront assembly systems, designed and fabricated for the application indicated, that complies with performance requirements specified as demonstrated by testing the system according to test methods indicated.

B. Exterior Performance Requirements (Exterior Entrances and Storefronts): Testing will demonstrate compliance with requirements indicated in AAMA 101 for air infiltration, water penetration, and structural performance for type, grade, and performance class of assemblies required.

1. Air-Infiltration Rate: Not more than 0.06 cfm/ft. of area for an inward test pressure of 6.24 lbf/sq. ft.
2. Water Infiltration: No uncontrolled leakage when tested in accordance with ASTM E331 at test pressure of 12 psf as defined in AAMA 501.
3. Deflection of Framing Members:

a. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
b. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch, whichever is smaller.

4. Structural Performance: No failure or permanent deflection in excess of 0.4 percent of any member's span after removing the imposed load, for a positive (inward) and negative (outward) test pressure of 40 lbf/sq. ft. and negative (outward) test pressure of 60 lbf/sq. ft. at corners.
5. Energy Performance: Certify and label energy performance according to NFRC as follows:

    a. Thermal Transmittance (U-factor): Fixed glazing and framing areas will have U-factor of not more than 0.35 Btu/sq. ft. x h x deg. F (at windows) and U of 0.77 Btu/sq. ft. x h x deg. F (at doors) as determined according to NFRC 100.
    b. Solar Heat Gain Coefficient (SHGC): Fixed glazing and framing areas will have a solar heat gain coefficient of no greater than 0.37 as determined according to NFRC 200.
    c. Condensation Resistance: Fabricate exterior aluminum and glass assemblies of "thermally improved" construction, provide units tested for thermal performance according to AAMA 1503.1 showing a condensation resistance factor (CRF) of 57 (glass) and 70 (frame).

6. Sound Transmission Class (STC): Rated for not less than 31 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413.
7. Thermal Movements: Provide assemblies that allow thermal movement resulting from the following maximum change (range) in ambient temperature when engineering, fabricating, and installing aluminum assemblies to prevent buckling, opening of joints, and overstressing of components, connections, and other detrimental effects. Base engineering calculation on actual surface temperatures of materials due to solar heat gain and nighttime sky heat loss.

    a. Temperature Change (Range): 120 degrees F, ambient; 180 degrees F, material surfaces.

C. Interior Performance Requirements (Interior Entrances and Storefronts): Testing will demonstrate compliance with requirements indicated in AAMA 101 for air infiltration, water penetration, and structural performance for type, grade, and performance class of assemblies required.

1. Air-Infiltration Rate: Not more than 0.06 cfm/ft. of area for an inward test pressure of 6.24 lbf/sq. ft.
2. Deflection of Framing Members:

    a. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
    b. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch, whichever is smaller.

3. Structural Performance: No failure or permanent deflection in excess of 0.4 percent of any member's span after removing the imposed load, for a positive (inward) and negative

(outward) test pressure equal to that of the exterior entrances and storefronts unless otherwise indicated on the Drawings.

4. Thermal Movements: Provide assemblies that allow thermal movement resulting from the following maximum change (range) in ambient temperature when engineering, fabricating, and installing aluminum assemblies to prevent buckling, opening of joints, and overstressing of components, connections, and other detrimental effects. Base engineering calculation on actual surface temperatures of materials due to solar heat gain and nighttime sky heat loss.

    a. Temperature Change (Range): 120 degrees F, ambient; 180 degrees F, material surfaces.

2.2 PRODUCTS

A. Basis-of-Design Product for Exterior Storefronts: Subject to compliance with requirements, provide Trifab 451T system as manufactured Kawneer; an Alcoa company or comparable product by one of the following:

1. Omega.
2. Vistawall Architectural Products.
3. Or approved equal.

B. Basis-of-Design Products for Interior Storefronts: Subject to compliance with requirements, provide Trifab 400 Framing System as manufactured Kawneer; an Alcoa company or comparable product by one of the following:

1. Omega.
2. Vistawall Architectural Products.
3. Or approved equal.

2.3 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

1. Sheet and Plate: ASTM B 209.
2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
3. Extruded Structural Pipe and Tubes: ASTM B 429.
4. Structural Profiles: ASTM B 308/B 308M.
5. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.

B. Steel Reinforcement: Manufacturer's standard zinc-rich, corrosion-resistant primer, complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.

1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.

3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.4 FRAMING SYSTEMS

A. Framing Members: Manufacturer's standard extruded-aluminum framing members of with minimum 0.080 inch material wall thickness or as required to support imposed loads.

1. Dimensions: 2 by 4- 1/2 inch, unless otherwise indicated.
2. Exterior Framing:

a. Construction: Thermal.
b. Glazing System: Retained mechanically with gaskets on four sides.
c. Glazing Plane: As indicated.

B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
2. Reinforce members as required to receive fastener threads.
3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.

D. Framing System Gaskets and Sealants: Manufacturer's standard, recommended by manufacturer for joint type.

E. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.

2.5 GLAZING SYSTEMS

A. Glazing: As specified in Section 08 80 00 "Glazing."

B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, molded or extruded, of profile and hardness required to maintain watertight seal.

C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.

2.6 ENTRANCE DOOR SYSTEMS

A. Entrance Doors, Exterior: Manufacturer's standard, glazed entrance doors compatible with selected storefront system, for manual-swing operation.

1. Door Construction: 1-3/4-inch overall thickness, with minimum 0.125-inch- thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with

reinforcing brackets that are deeply penetrated, and fillet welded or that incorporate concealed tie rods.

2. Glazing Stops and Gaskets: Square, snap-on, extruded-aluminum stops and preformed gaskets.

B. Basis of Design Product for Interior Entrance Doors: Subject to compliance with requirements, provide 190 Narrow Stile Entrances as manufactured Kawneer; an Alcoa company or comparable product by one of the following:

1. Omega.
2. Vistawall Architectural Products.
3. Or approved equal.

C. Basis of Design Product for Exterior Entrance Doors: Subject to compliance with requirements, provide 350 T Medium Style Entrances as manufactured Kawneer; an Alcoa company or comparable product by one of the following:

1. Omega.
2. Vistawall Architectural Products.
3. Or approved equal.

D. Bottom Rail Height: As indicated on the Drawings.

E. Entrance Door Hardware: As specified in Section 08 71 00 "Door Hardware."

2.7 ACCESSORY MATERIALS

A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Division Section 07 92 00 "Joint Sealants."

B. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30-mil thickness per coat.

2.8 FABRICATION

A. General: Form components to required shapes and sizes, with true curves, lines and angles. Provide components in sizes and profiles indicated, but not less than required to comply with performance requirements.

1. Thermal-Break Construction: Fabricate framing system with a concealed, low-conductance thermal barrier, located between exterior materials and interior members. Use manufacturer's standard construction that has been in use for not less than 3 years.

B. Allow for movement resulting from an air temperature change of 120 deg. F in the design of storefront assemblies, to prevent buckling, opening up of joints and overstressing of welds and fasteners.

C. Comply with AWS for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of exposed side. Clean exposed welded joints of all welding flux, grind smooth and flush, restore mechanical finish.

D. Mill joints to a tight, hairline fit, unless otherwise shown. Cope or miter corner joints. Form joints exposed to weather to exclude water.

E. Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping, handling and installation.

F. Reinforcing: Install reinforcing as required for hardware and necessary for performance requirements, sag resistance and rigidity.

G. Dissimilar Metals: Separate dissimilar metals with zinc chromate primer, bituminous paint, or other separator to prevent corrosion.

H. Continuity: Maintain accurate relation of planes and angles, with hairline fit of contacting members.

2.9 COMPONENTS

A. Storefront Framing System: Provide inside-outside matched framing system of channel and tubular aluminum extrusions as shown, with provisions for glass replacement. Shop fabricate and preassemble frame components where possible. Provide fully welded or mechanical jointed assemblies, unless otherwise indicated. Reinforce as necessary to support required loads.

B. Doors: Provide manufacturer's aluminum door systems designed and fabricated of size and profile requirements with fittings and hardware as indicated on Drawings and as shown on shop drawings.

1. Fabricate work to accommodate required fittings, hardware, anchors, reinforcement, and accessory items. Provide tubular stile members, fabricated with welded or watertight mechanical joints.
2. Prefabrication: Complete fabrication, assembly, finishing, hardware application, and other work to the greatest extent possible before shipment to the Project site. Disassemble component only as necessary for shipment and installation.
3. Continuity: Maintain accurate relation of planes and angles, with hairline fit of contacting members.
4. Glass and Glazing Materials: Glass and glazing materials will comply with requirements of Section 08 80 00 “Glazing” of these Specifications. Provide fully tempered safety glass where indicated.

    a. Provide insulating glazing units for exterior applications and tempered single glazed units for interior applications.

2.10 HARDWARE

A. General: Provide heavy-duty hardware units in sizes, number, and type recommended by manufacturer for entrances indicated. Finish exposed parts to match door finish, unless otherwise indicated.

B. Refer to Section 08 71 00 “Door Hardware” for requirements. Coordinate with hardware supplier and the Commissioner for keying and controls.

2.11 ALUMINUM FINISHES

A. General: Comply with NAAMM "Metal Finishes Manual" for recommendations relative to applying and designating finishes.

B. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.

C. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine the structure for location tolerances and material conditions that affect proper installation of components.

B. Notify the Contractor and Commissioner in writing of conditions unsatisfactory for installation.

C. Do not commence Work of this Section in affected areas until unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Comply with manufacturer's instructions for protecting, handling, and installing fabricated components, with particular care and attention to preservation of edges and sealants. Discard or remove and replace damaged members.

B. Install assemblies in accordance with approved Shop Drawings, using workers specifically trained in the installation of this type of work.

C. Set units plumb, level, and true to line, without warp or rack of framing members. Install components in proper alignment and relation to established lines and grades indicated. Provide proper support and anchor securely in place.

D. Anchor components securely in place as indicated on Shop Drawings. Shim and allow for movement resulting from changes in thermal conditions. Provide separators and isolators and coatings to prevent corrosion, and electrolytic deterioration between dissimilar materials and other materials.

E. Set sill members and other members in bed of sealant as indicated, or with joint fillers or gaskets as indicated to provide weathertight construction. Comply with requirements of Division 7 for sealants, fillers, and gaskets.

F. Glazing: Inspect glass and framing for compliance with manufacturing and installation tolerances, including size, squareness, and offsets at corners; for existence of minimum face or edge clearances; for manufacturing imperfections; for edge conditions; and for effective sealing of joinery.

1. Avoid point loading of glass.
2. Do not proceed with glazing work until unsatisfactory conditions have been corrected.
3. Do not field cut glass.
4. Comply with requirements of Section 08 80 00 “Glazing.”

3.4 ADJUSTING

A. Adjust operating hardware to function properly, for smooth operation without binding and for weathertight closure.

3.5 CLEANING

A. Clean completed system, inside and out, promptly after erection and installation of glass and sealants, allowing for curing of sealants.

B. Installer will advise the Contractor of proper and adequate procedures for protection and cleaning during the remainder of the construction period so that the system will be without damage and deterioration at time of acceptance.

3.6 PROTECTION

A. Institute protective measures required throughout the remainder of the construction period to ensure that entrance assemblies will be without damage or deterioration, other than normal weathering, until time of Substantial Completion.

END OF SECTION 08 41 13

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 08 44 13 - GLAZED ALUMINUM CURTAIN WALLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section includes:

1. Glazed aluminum curtain walls.
2. Integrated cantilevered canopy.
3. Installation accessories.

1.3 DEFINITIONS

A. Curtainwall Assemblies: Where the term curtain wall or curtain wall assemblies are used, the term refers to the complete system consisting of thermally isolated aluminum profiles supported by steel structure, glazed, mechanically fixed insulating units, canopy assembly, metal panels, entrance doors, hardware, soffits, copings, fascias, flashings, trims, seals, gaskets, sealants, fasteners, related drainage accessories, provisions for attachment of steel handrails to steel structure and all other related accessories.

1.4 COORDINATION

A. Loads of Attached Work: Coordinate with manufacturers of glazing, as indicated on drawings, to confirm that curtain wall will fully support dead loads and wind loads imposed by products proposed for installation in curtain wall assembly.

B. Coordinate curtain wall installation with metal panels, flashing, trim, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.6 SYSTEM DESCRIPTION

A. Aluminum, Steel and Glass Curtain Wall System: System consists of extruded aluminum thermally isolated profiles structurally supported by steel structure, glazed with mechanically fixed insulating units.

B. Glazed curtain wall system will consist of an exterior rain barrier tightly sealed and capable of protecting openings to the exterior.

1. The glazing system will be connected to the supporting structure via aluminum base profiles by means of alternating of bolting or pin setting.

    a. To avoid contact corrosion and noise caused by expansion, a separating strip will be placed between the steel substructure and the aluminum base profile.
    b. A large-volume EPDM seal with integrated ventilation grooves will form the basis for accommodating the glazing and for ventilating the construction.
    c. An airtight connection to the building will be ensured by using building connection seals.
    d. Glazing system will be retained mechanically with toggles on four sides.

2. System Incorporates:

    a. Metal Panel (M3): Formed aluminum insulated copings and fascia with formed aluminum finish trim caps.
    b. Interior soffits and finishes between curtain wall and adjacent construction is by other trades.
    c. Aluminum / Steel inserts or brackets as required.
    d. Fasteners.
    e. Concealed stainless steel flashings.
    f. Membrane connections to building construction.
    g. Installation of security devices (provided by other trades) and integration of wiring within the system framing.
    h. Refer to Section 07 42 13.16 “Metal Plate Wall Panels” for additional requirements.

3. Entrance Door:

    a. Double leaf single acting entrance door with thermal break.
    b. Basis of Design: Refer to Section 08 41 13 “Aluminum Framed Entrances and Storefronts” for requirements.
    c. The door assembly will include insulated glass, rails and jambs of extruded aluminum cladding, stainless-steel push-pulls, panic hardware, reinforcements, thresholds, closing and operating mechanisms, pivots, locksets and all other hardware and accessories required to achieve a complete installation.

        1) Refer to Section 08 80 00 “Glazing” for additional requirements.
        2) Refer to Section 08 71 00 “Door Hardware” for additional requirements.

    d. Door Finish. Class I Anodized.

4. Provision for attachment of steel stair handrail to steel structure.
5. Visually Exposed Finishes:

    a. Finish of all aluminum exposed to the exterior is to be type AL1: three-coat PVDF.
    b. Finish of all aluminum exposed to the interior is to be type AL2: two coat PVDF.
    c. Where visible, glazing gaskets, and weather seal silicone color to be black.

C. Aluminum Metal Panel for Fascia, Soffits and Trim (M3):

1. System consists of aluminum rainscreen cladding panels, M3, hung onto manufacturer's standard profile frames, as required, fastened through insulation (by other trades) to weather barrier protected substrate (by other trades).
2. System Includes the Following:

   a. Stretcher leveled aluminum panels. Panel sheets are to be scored and back-cut to achieve a sharp arris.
   b. Open joints with aluminum backing plates and stainless-steel fasteners.
   c. Systems to include accommodation for individual panel adjustment or replacement.
   d. Finish of all aluminum exposed to the exterior is to be three-coat PVDF. Color to be as noted on the Drawings from manufacturer's standard color selection. Refer to Section 07 42 13.16 "Metal Plate Wall Panels" for additional requirements.

D. Metal Panels for Canopy, Soffits, Fascia, and Trim (M4):

1. System will consist of aluminum rainscreen cladding panels, hung onto manufacturer's standard profile frames, as required, fastened to steel structure.
2. System Includes the Following:

   a. Stainless steel gutter.
   b. Stretcher leveled, aluminum panels. Panel sheets are to be scored and back-cut to achieve a sharp arris.
   c. Open joints with aluminum backing plates and stainless-steel fasteners.
   d. Systems to include accommodation for individual panel adjustment or replacement.
   e. Finish of all aluminum exposed to the exterior is to be three-coat PVDF. Color from manufacturers standard color selection.
   f. Refer to Section 07 42 13.16 "Metal Plate Wall Panels" or additional requirements.

1.7 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.8 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Environmental Product Declaration: For each product.
2. Health Product Declaration: For each product.
3. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.
4. Laboratory Test Reports: For sealants, indicating compliance with requirements for low-emitting materials.
5. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

6. Product Data: For sealants, indicating VOC content.

C. Shop Drawings: Include plans, elevations, sections, full-size details, and attachments to other work.

1. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
2. Indicate locations and areas of related work to be mounted to or within curtain wall mullions, including glazing and aluminum base profile and fins.
3. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
4. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
5. Show reflected ceiling plans and roof plans for canopy assembly. Include jointing and seaming pattern. Show anchorage and accessory items.

D. Samples: For each type of exposed finish required.

E. Engineering Services Submittal: For glazed aluminum curtain walls, submit design calculations sealed and signed by the qualified Contractor's Professional Engineer, licensed in the State of New York responsible for their preparation.

1. Engineering services documentation will be submitted to Commissioner for review and approval prior to any work.

1.9 INFORMATIONAL SUBMITTALS

A. Energy Performance Certificates: NFRC-certified energy performance values for each glazed aluminum curtain wall.

B. Product test reports.

C. Source quality-control reports.

D. Field quality-control reports.

E. Sample warranties.

1.10 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.11 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Installer with Special Experience:

1. Installer Qualifications: An entity meeting the requirements of DDC General Conditions Section 014000 1.7/C/1.

C. Fabricator with Special Experience:

1. 1) Fabricator Qualifications: An entity meeting the requirements of DDC General Conditions Section 014000 1.7/C/2.

D. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

1. Do not change intended aesthetic effects, as judged solely by Commissioner, except with Commissioner's approval. If changes are proposed, submit comprehensive explanatory data to Commissioner for review.

E. On-site Facade Mockup: Construct on-site facade mockup as indicated on the Drawings, incorporating work specified in this section. All required submittals for the work specified in this section will be submitted by the Contractor and accepted by the Commissioner prior to the Contractor furnishing elements for the on-site facade mockup.

1. Provide complete glazed aluminum curtain wall installation in sizes, quantities, and configuration indicated on the drawings for use in the on-site facade mockup.
2. Incorporate full-scale details of the architectural features, approved finishes, brackets, gasketing, sealants, and attachments to be provided at full-scale building.
3. Approval of on-site facade mockup does not constitute approval of deviations from the Contract Documents contained in the on-site facade mockup unless the Commissioner specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.12 WARRANTY

A. Special Assembly Warranty: Manufacturer agrees to restore or replace components of glazed aluminum curtain wall that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

B. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to restore finishes or replace aluminum that shows evidence of deterioration of baked enamel, powder coat, or organic finishes within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Engineering Services: Engage a qualified Professional Engineer licensed in the State of New York to design curtain wall assemblies including connections.

1. Engineering Services will include complete calculations for glazed aluminum curtain walls and connections required for this project.

a. Indicate required design loads, including live loads, wind loads, seismic loads, and dead loads and handling stresses during shipment and erection including loads from construction procedures.
b. Design calculations will be based on Performance Requirements and product design criteria indicated.

B. General: Comply with performance requirements specified, as determined by testing of glazed aluminum curtain walls representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Glazed aluminum curtain walls will withstand movements of supporting structure, including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
2. Failure also includes the following:

a. Thermal stresses transferring to building structure.
b. Glass breakage.
c. Noise or vibration created by wind and thermal and structural movements.
d. Loosening or weakening of fasteners, attachments, and other components.
e. Failure of operating units.

C. Structural Loads:

1. Wind Loads: 20 mph unless otherwise indicated on Drawings.
2. Other Design Loads: As indicated on Drawings.

D. Deflection of Framing Members: At design wind pressure, as follows:

1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch.

a. Operable Units: Provide a minimum 1/16-inch clearance between framing members and operable units.

3. Cantilever Deflection: Where framing members overhang an anchor point, as follows:

    a. Perpendicular to Plane of Wall: No greater than 1/240 of clear span plus 1/4-inch for spans of greater than 11 feet 8-1/4 inches or 1/175 times span, for spans of less than 11 feet 8-1/4 inches.

E. Structural: Test according to ASTM E330/E330M as follows:

1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceed 0.2 percent of span.
3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

F. Air Infiltration: Test according to ASTM E283 for infiltration as follows:

1. Fixed Framing and Glass Area: Maximum air leakage of 0.06 cfm/sq. ft. at a static-air-pressure differential of 6.24 lbf/sq. ft.
2. Operable Units: Maximum air leakage of 0.06 cfm/sq. ft. at a static-air-pressure differential of 6.24 lbf/sq. ft.

G. Water Penetration under Static Pressure: Test according to ASTM E331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 15 lbf/sq. ft.

H. Energy Performance: Certify and label energy performance as follows:

1. Thermal Transmittance (U-factor):

    a. Fixed glazing and framing areas as a system will have overall U-factor of not more than 0.3 Btu/sq. ft. x h x deg F as determined according to NFRC 100 for a system specimen size of 78-3/4 by 78-3/4 inch, when fitted with 1-3/4 inch glazing with U-factor of 0.16.

2. Condensation Resistance:

    a. Fixed glazing and framing areas as a system will have an NFRC-certified condensation resistance rating of no less than 66 as determined according to NFRC 500.

I. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 HIGH- PERFORMANCE, GLAZED ALUMINUM CURTAIN WALLS

A. Basis of Design Product: Subject to compliance with requirements, provide AOC 60 SG ST as manufactured by Schuco, or comparable product by one of the following:

1. Jansen; VISS Basic SG TVS.
2. Reynaers - CW50 Alu on Steel with Clamped Glazing,
3. Technal - Spinal MY 62 with Clamped Glazing (Minimal).
4. Or approved equal.

B. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Construction: Thermally broken with fiberglass pressure plates.
2. Glazing System: Retained mechanically with gaskets on four sides.
3. Glazing Plane: Front.
4. Finish: Superior-performance organic finish.
5. Fabrication Method: Field-fabricated stick system.
6. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
7. Steel Reinforcement: As required by manufacturer.

C. Pressure Caps: Aluminum components that conceal fiberglass pressure plates to mechanically retain glazing.

1. Include snap- on aluminum trim that conceals fasteners.

D. Brackets and Reinforcement: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

2.3 GLAZING

A. Glazing: Comply with Section 08 80 00 "Glazing."

B. Glazing Gaskets: ASTM C509 or ASTM C864. Compression-type, replaceable EPDM with integrated ventilation tubes.

1. Color: Black.

C. Glazing Sealants: Comply with Section 08 80 00 "Glazing."

1. Sealant must have a VOC content of 250 g/L or less.
2. Sealant must comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

D. Weatherseal Sealants: ASTM C920 for Type S; Grade NS; Class 25; Uses NT, G, A, and O; chemically curing silicone formulation that is compatible with structural sealant and other

system components with which it comes into contact; recommended by structural-sealant, weatherseal-sealant, and structural-sealant-glazed curtain-wall manufacturers for this use.

1. Sole Source Product: Dow; "Dowsil 791".
2. No substitutions permitted.

E. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.
2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

F. Sole Source Product Silicone Sheet Membrane Systems: Subject to compliance with requirements, provide Silicone Transition Strip and System as manufactured by Dow.

1. No substitutions permitted.

G. Sole Source Product Expanded Cellular Glazing Tapes: Closed-cell, Acrylic foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

   a. Sole Source Product: 3M; VHB Structural Glazing Tape.
   b. No substitutions permitted.

2.4 MATERIALS

A. Sheet and Plate: ASTM B209.

B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221.

C. Extruded Structural Pipe and Tubes: ASTM B429/B429M.

D. Structural Profiles: ASTM B308/B308M.

E. Steel Reinforcement:

1. Structural Shapes, Plates, and Bars: ASTM A36/A36M.
2. Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
3. Hot-Rolled Sheet and Strip: ASTM A1011/A1011M.

F. Stainless Steel:

1. Shapes, Plates, Bars and Strip (Exposed): ASTM A 666, AISI Type 316.

2. Shapes, Plates, Bars and Strip (Concealed): ASTM A 666, AISI Type 304.

G. Metal Plate Canopy Panels:

1. Aluminum Sheet: Tension-leveled, smooth aluminum sheet, ASTM B209, 0.0808 inch thick.
2. Attachment Assembly: Rainscreen-principle system.
3. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
4. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
5. Refer to Section 07 42 14 “Metal Plate Wall Panels” for additional requirements for metal plate panels.

H. Steel Reinforcement Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.

2.5 CANOPY FASTENERS AND ACCESSORIES

A. General: Of same basic metal as fastened metal, unless otherwise indicated. Do not use metals which are corrosive or otherwise incompatible with metals joined.

B. Non-shrink Nonmetallic Grout: Pre-mixed, factory-packaged, nonstaining, noncorrosive grout complying with CE CRD C621.

C. Anchors and Inserts: Provide anchors of type, size, and material required for conditions shown. Use nonferrous metal or hot-dipped galvanized anchors and inserts for exterior locations and elsewhere as required for corrosion resistance.

D. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for the metal alloy to be welded.

E. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12 except containing no asbestos fibers. Comply with ASTM D 1187, Type II.

2.6 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.
2. Accurately fitted joints with ends coped or mitered.
3. Physical and thermal isolation of glazing from framing members.
4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
5. Provisions for field replacement of glazing from exterior.
6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Fabricate components to resist water penetration as follows:

1. Internal guttering system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.
2. Pressure-equalized system or double barrier design with primary air and vapor barrier at interior side of glazed aluminum curtain wall and secondary seal weeped and vented to exterior.

E. Curtain-Wall Framing: Fabricate components for assembly using manufacturer's standard assembly method.

F. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.7 CANOPY FABRICATION

A. Sizes and Profiles: Required sizes and profiles are as indicated, comply with size and profile requirements, for structural and performance criteria as specified.

B. Assembly: Carefully match profiles to produce continuity of line, design and finish. Joints in exposed work, unless otherwise required for thermal movement, must be accurately fitted, rigidly secured and sealed watertight.

1. Comply with AWS for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of exposed side. Clean exposed welded joints of all welding flux, and dress on all exposed and contact surfaces to match adjacent finish.
2. Mechanical connections, where permitted, must be thoroughly cleaned, primed and sealed with sealant immediately prior to final assembly. Clean excess sealant from exposed surfaces.
3. Expansion joints must be designed and constructed to be permanently watertight and accommodate weather and building dynamics.
4. Fabricate panel joints with captive gaskets or separator strips, which provide a tight seal and prevent metal-to-metal contact in a manner that will minimize noise from movements within panel system.

C. Drainage: Provide means of drainage for water which may accumulate in members of the metal panel canopy.

D. Flashing: Provide exposed closures, curb flashing and other concealed flashings of 0.0179-inch minimum dead-soft stainless steel, type selected by manufacturer for compatibility with other components, coordinate with Section 07 62 00 “Sheet Metal Flashing and Trim”.

E. Joint Sealants: Refer to Section 07 92 00 “Joint Sealants” for materials and requirements.

2.8 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual" recommendations for applying and designating finishes

B. Protect finishes on exposed surfaces from damage in accordance with coating manufacturers requirements.

C. Apply organic finishes to formed metal after fabrication unless otherwise indicated.

D. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.9 ALUMINUM FINISHES

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

B. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

C. High-Performance Organic Finish, Two-Coat PVDF (AL2): Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat.

1. Color and Gloss: As selected by Commissioner from manufacturer's full range.

D. Superior-Performance Organic Finish, Three-Coat PVDF (AL1): Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat.

1. Color and Gloss: As selected by Commissioner from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Prepare surfaces that will contact structural sealant according to sealant manufacturer's written instructions to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.

3.4 INSTALLATION OF CURTAIN WALL

A. Comply with manufacturer's written instructions.

B. Do not install damaged components.

C. Fit joints to produce hairline joints free of burrs and distortion.

D. Rigidly secure nonmovement joints.

E. Anchor curtain wall to floor slabs, floor slab secondary framing, and cast-in-place roof curb, as indicated on drawings. Anchor to additional structure at points between floor slabs or to adjacent precast concrete wall panels is not permitted.

1. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.

F. Where welding is required, weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.

G. Seal joints and exterior faces of pressure-plate fasteners watertight, unless otherwise indicated.

H. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with primer, applying sealant or tape, or installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

I. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.

J. Install components plumb and true in alignment with established lines and grades.

3.5 INSTALLATION OF GLAZING

A. Install glazing as specified in Section 08 80 00 "Glazing."

3.6 INSTALLATION OF CANOPY

A. Anchors: Provide anchors and fasteners where necessary for securing metal fabrications to in-place construction.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installation of metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

C. Fit exposed connections accurately to form hairline joints. Weld connections that cannot be shop welded. Do not weld, cut, or abrade units which have been hot-dip galvanized after fabrication.

D. Field Welding: Comply with AWS Code for welding, appearance and quality of welds made, methods used in correcting welding work, and as required for shop welding.

E. Corrosion Protection: Coat metal surfaces which will be in contact with grout, concrete, masonry, treated wood or dissimilar metals, with bituminous paint or zinc chromate primer.

F. Manufactured Items: Install manufactured products to comply with manufacturer's instructions unless otherwise shown.

3.7 INSTALLATION OF WEATHERSEAL SEALANT

A. Remove temporary retainers and insert backer rod between lites of glass, as recommended by sealant manufacturer.

B. Install weatherseal sealant to completely fill cavity, in accordance with sealant manufacturer's written instructions, to produce weatherproof joints.

3.8 ERECTION TOLERANCES

A. Install glazed aluminum curtain walls to comply with the following maximum tolerances:

1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
3. Alignment:

   a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
   b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
   c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch.

4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

3.9 ADJUSTING AND CLEANING

A. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting. Comply with SSPC-PA 1 to provide a minimum dry film thickness of 2.0 mils.

B. For galvanized surfaces clean welds, bolted connections and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

C. Protect finishes of canopies with temporary protective coverings approved by metal panel manufacturer. Remove protective covering at time of Substantial Completion.

D. Restore damaged finishes so that no evidence remains of correction work. Return items which cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units as required.

E. Glazed aluminum curtain walls and waterproofing will be considered defective if they do not pass tests and inspections.

END OF SECTION 08 44 13

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 08 51 13 - ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section includes the following aluminum window types for exterior locations.

1. Fixed.
2. Casement.
3. Projected.
4. Hopper.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review and discuss the finishing of aluminum windows that is required to be coordinated with the finishing of other aluminum work for color and finish matching.
3. Review, discuss, and coordinate the interrelationship of aluminum windows with other exterior wall components. Include provisions for anchoring, flashing, weeping, sealing perimeters, and protecting finishes.
4. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
5. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 "Submittal Procedures."

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, glazing and fabrication methods, dimensions of individual components and profiles, hardware, and finishes for aluminum windows.

B. Shop Drawings: For aluminum windows.

1. Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.

C. Samples: For each exposed product and for each color specified, 2 by 4 inches in size.

D. Samples for Initial Selection: For units with factory-applied finishes.

1. Include Samples of hardware and accessories involving color selection.

E. Samples for Verification: For aluminum windows and components required, showing full range of color variations for finishes, and prepared on Samples of size indicated below:

1. Exposed Finishes: 2 by 4 inches.
2. Exposed Hardware: Full-size units.

F. Product Schedule: For aluminum windows. Use same designations indicated on Drawings.

G. Engineering Services Submittal: For aluminum windows, submit design calculations sealed and signed by the qualified Contractor's Professional Engineer, licensed in the State of New York responsible for their preparation.

1. Engineering services documentation will be submitted to Commissioner for review and approval prior to any work.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and Installer.

B. Product Test Reports: For each type of aluminum window, for tests performed by a qualified testing agency.

C. Sample Warranties: For manufacturer's warranties.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 "Quality Requirements."

B. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed performance requirements indicated and of documenting this performance by test reports and calculations.

C. Installer Qualifications: trained and approved by manufacturer for installation of units required for this Project.

D. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

1. Do not change intended aesthetic effects, as judged solely by Commissioner, except with Commissioner's approval. If changes are proposed, submit comprehensive explanatory data to Commissioner for review.

E. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1. Build mockup of typical wall area as shown on Drawings.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Commissioner specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace aluminum windows that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure to meet performance requirements.
b. Structural failures including excessive deflection, water leakage, condensation, and air infiltration.
c. Faulty operation of movable sash and hardware.
d. Deterioration of materials and finishes beyond normal weathering.
e. Failure of insulating glass.

2. Warranty Period:

a. Window: 10 years from date of Substantial Completion.
b. Glazing Units: 10 years from date of Substantial Completion.
c. Aluminum Finish: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain aluminum windows from single source from single manufacturer.

2.2 WINDOW PERFORMANCE REQUIREMENTS

A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

1. Window Certification: AAMA certified with label attached to each window.

B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:

1. Minimum Performance Class: AW.
2. Minimum Performance Grade: 100.

C. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.30 Btu/sq. ft. x hr x deg F.

D. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of 0.37.

E. Condensation-Resistance Factor (CRF): Provide aluminum windows tested for thermal performance according to AAMA 1503, showing a CRF of 45.

F. Thermal Movements: Provide aluminum windows, including anchorage, that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F ambient; 180 deg F material surfaces.

G. Air, Water and Structural Performance Requirements:

1. When tested in accordance with cited test procedures, windows will meet or exceed the following performance criteria, as well as those indicated in NAFS for Architectural AW Performance Class windows, Performance Grade 100 (AW100) unless otherwise noted herein.

   a. Test units will not be smaller in either width or height than the "Gateway Test Size" specified in NAFS for AW Performance Class.
   b. "Downsize" testing to meet Optional Performance Class requirements specified herein will not be permitted.
   c. Testing to previous, less stringent versions of NAFS will not be acceptable.
   d. Test units will employ manufacturer's standard sealing, lock spacing and anchorage.

2. Air Test Performance Requirements:

   a. Air infiltration maximum 0.1 cfm per square foot at 6.24 psf pressure differential when tested in accordance with ASTM E283.

3. Water Test Performance Requirements:

   a. No uncontrolled water leakage at 15.00 psf static pressure differential, with water application rate of 5 gallons/hr/sq ft when tested in accordance with both ASTM E331 and ASTM E547. Static water test will be repeated after application of design test pressures.

4. Structural Test Performance Requirements:

a. Uniform Load Deflection Test
   1) No deflection of any unsupported span L of test unit (framing rails, muntins, mullions, etc.) in excess of L/175 at both a positive and negative load of 100 psf (design test pressure) when tested in accordance with ASTM E330.

b. Uniform Load Structural Test:
   1) Unit to be tested at 1.5 times design test pressure, both positive and negative, acting normal to plane of wall in accordance with ASTM E330.
   2) No glass breakage; permanent damage to fasteners, hardware parts, or anchors; damage to make windows inoperable; or permanent deformation of any main frame or ventilator member in excess of 0.2% of its clear span.

5. Life Cycle Testing:

   a. When tested in accordance with AAMA 910-10, there is to be no damage to fasteners, hardware parts, support arms, activating mechanisms or any other damage that would cause the window to be inoperable at the conclusion of testing.

      1) Air infiltration and water resistance tests will meet the primary performance requirements specified after completion of 4000 operational cycles plus thermal cycling.
      2) Testing to previous, less stringent versions of AAMA 910 will not be acceptable.

2.3 ALUMINUM WINDOWS

A. Basis of Design Product: Subject to compliance with requirements, provide 2250i, 3250i, or 4250i as manufactured by Wausau Window and Wall Systems, or comparable product by one of the following:

   1. Kawneer Company, Inc.; Arconic Corporation.
   2. TRACO.
   3. Or approved equal.

B. Types: Provide the following types in locations indicated on Drawings:

   1. Casement.
   2. Projected.
   3. Fixed.
   4. Project-in hopper.

C. Frames and Sashes: Aluminum extrusions complying with AMA/WDMA/CSA 101/I.S.2/A440.

   1. Thermally Improved Construction: Fabricate frames, sashes, with an integral, concealed, low-conductance thermal barrier located between exterior materials and window members exposed on interior side in a manner that eliminates direct metal-to-metal contact.

D. Glass: Comply with Section 08 80 00 "Glazing."

E. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.

F. Hardware, General: Provide manufacturer's standard hardware fabricated from, stainless steel, complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock windows, and sized to accommodate sash weight and dimensions.

1. Exposed Hardware Color and Finish: As selected by Commissioner from manufacturer's full range.

G. Casement and Projected Window Hardware:

1. Gear-Type Rotary Operators: Complying with AAMA 901 when tested according to ASTM E405, Method A. Provide operators that function without requiring the removal of interior screens or using screen wickets.

a. Type and Style: As selected by Commissioner from manufacturer's full range of types and styles.

2. Hinges: Non-friction type, not less than two per sash.
3. Lock: Key-operated custodial lock with keeper and removable handle.
4. Limit Devices: Concealed friction adjustor, adjustable stay bar limit devices designed to restrict sash opening.

a. Limit clear opening to 4 inches for ventilation; with custodial key release.

H. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.

I. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.

1. Exposed Fasteners: Do not use exposed fasteners to greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.

2.4 ACCESSORIES

A. Subsills: Thermally broken, extruded-aluminum subsills in configurations indicated on Drawings.

B. Interior Trim: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.

C. Panning Trim: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.

2.5 FABRICATION

A. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.

B. Glaze aluminum windows in the factory.

C. Weather strip each operable sash to provide weathertight installation.

D. Weep Holes: Provide weep holes and internal passages to conduct infiltrating water to exterior.

E. Provide water-shed members above side-hinged sashes and similar lines of natural water penetration.

F. Mullions: Provide mullions and cover plates, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections. Provide mullions and cover plates capable of withstanding design wind loads of window units.

G. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation.

2.6 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 ALUMINUM FINISHES

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

B. Class I, Color Anodic Finish: AA-M12 C22 A42/A44 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA 611.

1. Color: Matte black, where indicated.
2. Color: Champagne, where indicated.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.

C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight window installation.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E2112.

B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.

C. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.

D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.4 ADJUSTING, CLEANING, AND PROTECTION

A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.

B. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

1. Keep protective films and coverings in place until final cleaning.

C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

D. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written instructions.

END OF SECTION 08 51 13

SECTION 08 71 00 – DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:
   1. Mechanical and electrified door hardware for swinging doors.

B. Related Sections:
   1. Section 08 11 13 "Hollow Metal Door and Frames" for interior door assemblies.
   2. Section 08 41 13 "Aluminum Framed Entrances and Storefronts" for entry door assemblies.
   3. Division 28 00 00 "Electronic Safety and Security" for magnetic door contacts and position switches
   4. Division 28 46 20 "Fire Alarm" for coordination with other components of electronic access control system.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Before any finish hardware is ordered or purchased, submit catalog cuts and a complete Hardware Schedule of Finish Hardware. Each item listed in the Hardware Schedule must be identifiable with respect to manufacture, brand, catalog number, material, and finish.
   1. Product Data: Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
   2. Riser and Wiring Diagrams: After final approval of the hardware schedule, submit details of electrified door hardware, indicating:
      a. Wiring Diagrams: For power, signal, and control wiring and including:
         1) Details of interface of electrified door hardware and building safety and security systems.
         2) Schematic diagram of systems that interface with electrified door hardware.
         3) Point-to-point wiring.
         4) Risers.

3. Samples for Verification: If requested by Commissioner, submit production sample or sample installations of each type of exposed hardware unit in finish indicated, and tagged with full description for coordination with schedule.
   a. Samples will be returned to supplier in like-new condition. Units that are acceptable to Commissioner may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

4. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, including:
   a. Door Index; include door number, heading number, and Commissioner's hardware set number.
   b. Opening Lock Function Spreadsheet: List locking device and function for each opening.
   c. Type, style, function, size, and finish of each hardware item.
   d. Name and manufacturer of each item.
   e. Fastenings and other pertinent information.
   f. Location of each hardware set cross-referenced to indications on Drawings.
   g. Explanation of all abbreviations, symbols, and codes contained in schedule.
   h. Mounting locations for hardware.
   i. Door and frame sizes and materials.
   j. Name and phone number for local manufacturer's representative for each product.
   k. Operational Description of openings with any electrified hardware (locks, exits, electromagnetic locks, electric strikes, automatic operators, door position switches, magnetic holders or closer/holder units, and access control components). Operational description should include how door will operate on egress, ingress, and fire and smoke alarm connection.
      1) Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work that is critical in Project construction schedule.

5. Key Schedule: Provide full keying schedule
   a. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system's function, key symbols used and door numbers controlled.
   b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
   c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
   d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
   e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.

f. Forward bitting list, key cuts and key system schematic directly to the Commissioner, by means as directed by the Commissioner.
g. Prepare key schedule by or under supervision of supplier, detailing the Commissioner's final keying instructions for locks.

6. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory prepared for door hardware installation.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Supplier, Installer and Architectural Hardware Consultant.

B. Product Certificates for electrified door hardware, signed by manufacturer:
1. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.

C. Certificates of Compliance:
1. Certificates of compliance for fire-rated hardware and installation instructions if requested by the Commissioner.

D. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by qualified testing agency, for door hardware on doors located in accessible routes.

E. Warranty: Special warranty specified in this Section.

1.6 CLOSEOUT SUBMITTALS:

A. Operations and Maintenance Data: Provide in accordance with DDC General Conditions and include:
1. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
2. Catalog pages for each product.
3. Name, address, and phone number of local representative for each manufacturer.
4. Parts list for each product.
5. Final approved hardware schedule, edited to reflect conditions as-installed.
6. Final keying schedule
7. Copies of floor plans with keying nomenclature
8. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
9. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 "Quality Requirements."

B. Hardware must be suitable and adapted for its required use and must fit its designated location. Should any hardware as shown, specified, or required fail to meet the intended requirements or require modification to suit or fit the designated location, determine the correction or modification necessary and notify the Commissioner in ample time to avoid delay in the manufacture and delivery of hardware.

C. For fire rated openings provide hardware complying with NFPA Standard No. 80. requirements of New York City Department of Buildings.

D. Barrier Free Requirements: Maximum pressure applied to the latch area to open exterior doors must not exceed fifteen (15) pounds. Interior doors which have a self-closing feature will require pressure not to exceed five (5) pounds.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Pack finish hardware in approved manufacturer's containers, complete with trimmings, bolts, screws, washers, etc., as required for application and securement. Each container must bear a suitable label which must state the quantity and kind of contents of said container, as well as identifying marks relating to the approved Hardware Schedule and its location in the project.

B. Knobs, handles, pulls and other items of finish hardware with easily damaged finishes must be individually wrapped before placing in containers and with sufficient sheet cloth or cotton-backed paper which must be adequately tied with heavy strings; all as necessary to protect the finishes.

C. Finish hardware must be delivered, as directed, to the building site or the factories of the various fabricators of metal work to which such hardware is to be applied. Deliver hardware in the order required and in ample time to permit application at the building, or fabricators' shops, within the time required for the completion of the building.

1.9 JOB CONDITIONS

A. Templates: Promptly following approval of the Hardware Schedule by the Commissioner, furnish and deliver template information, to the fabricators, of items to which finish hardware is to be applied.

1. Such deliveries must be made in ample time to avoid delays in such work of said fabricators. Provide drawings, schedules and detailed information to other trades as necessary for them to accommodate and prepare their work to receive the finish hardware.

B. Cooperation and Coordination

1. Cooperate and coordinate work with that of other trades supplying materials or performing work in contact with, connecting to, underlying, or overlaying the work of this Section.

2. Provide complete data of requirements for work of this Section to those other trades whose work is affected by or dependent upon the work of this Section.

3. Furnish all items to be built into work of other trades in ample time to avoid delaying the progress of such work.

4. Examine all drawings covering the work of this Section and refer to all other drawings, including mechanical and electrical drawings, which may affect the work of this Section or require coordination by this trade.

C. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated.

2. Manufacturers that perform electrical modifications and that are listed by testing and inspecting agency acceptable to New York City Department of Buildings are acceptable.

D. Field Service: The hardware supplier must assign a competent representative, acceptable to the Commissioner, to be at the jobsite site each time a major shipment of hardware is received. Such representative must assist in "checking in" the shipment and must secure a receipt covering the contents of each shipment. In addition, such representative must be available for immediate call to the jobsite when necessary.

E. Keying Conference: Conduct conference at Project site to comply with requirements in the DDC General Conditions.

1. Attendees: Contractor, Commissioner, and Supplier's Architectural Hardware Consultant.

2. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:

   a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
   b. Preliminary key system schematic diagram.
   c. Requirements for key control system.
   d. Requirements for access control.
   e. Address for delivery of keys.

F. Pre-installation Conference: Conduct conference at Project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

2. Inspect and discuss preparatory work performed by other trades.

3. Inspect and discuss electrical roughing-in for electrified door hardware.

4. Review sequence of operation for each type of electrified door hardware.

5. Review required testing, inspecting, and certifying procedures.

G. Coordination Conferences:

1. Installation Coordination Conference: Prior to hardware installation, schedule and hold meeting to review questions or concerns related to proper installation and adjustment of door hardware.

   a. Attendees: Door hardware supplier, door hardware installer, Contractor.
   b. After meeting, provide letter of compliance to Commissioner, indicating when meeting was held and who was in attendance.

2. Electrified Hardware Coordination Conference: Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

   a. Attendees: electrified door hardware supplier, doors and frames supplier, electrified door hardware installer, electrical subcontractor, Commissioner and Contractor.
   b. After meeting, provide letter of compliance to Commissioner, indicating when coordination conference was held and who was in attendance.

1.10 WARRANTIES

A. Special Manufacturer's Warranty: Manufacturer agrees to furnish parts to restore or replace those elements that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware are indicated herein. Products are identified by using appropriate hardware designation numbers.

B. The finish hardware must conform to the requirements of the New York Department of Buildings and such requirements must be followed as if specifically set forth in this specification.

C. Finish hardware must conform to the applicable requirements of the National Board of Fire Underwriters' Laboratories, Inc., and each such item must bear a label or mark of the Underwriters' Laboratories, Inc., indicating its conformity with such requirements for use in connection with its specified location.

D. Finish hardware must be uniform in color and finish and free from imperfections affecting its appearance, function, operation and serviceability. Such hardware must be suited and adapted to its required use and must fit its respective location.

E. Where the finished shape or size of members receiving finish hardware are such as to prevent or render unsuitable the use of the specific types or sizes of such hardware, suitable types or sizes must be furnished, having as nearly as practicable the same function, operation and quality as the specified hardware.

F. Bolts, screws and other fastenings required for the application of the finished hardware must be of size and type to fit requirements and must be of the same material and finish as the exposed parts of such hardware which they adjoin. Exposed screws and bolts must have countersunk oval heads and bolts must be provided with cap nuts. Countersunk part of screw and bolt holes must be finished smoothly without sharp edges and form a firm seal for such screw and bolt heads. Full threaded wood screws must be furnished for all wood applications. No thru bolts will be allowed.

G. See Hardware Sets for devices.

2.2 MATERIALS

A. Fasteners
   1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.

   2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.

3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Commissioner if thru-bolts are required.

4. Install hardware with fasteners provided by hardware manufacturer.

B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
   1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

2.3 HINGES

A. Basis-of-Design Product, for five-knuckle ball bearing hinges: Subject to compliance with requirements, provide Stanley (ST) FBB 179 series or comparable product by one of the following:
   1. McKinney, TA/t4A series
   2. Ives 5BB series
   3. Or approved equal.

B. Requirements
   1. Minimum of three (3) hinges per door leaf up to 7'-6" high. Provide one additional hinge per 2'-6" or fraction thereof.
   2. Hinges must be of types, sizes and materials as required to suit door weights thicknesses and fire ratings.
   3. Hinge sizes must be detailed so that the least amount of projection must be visible from the frame.
   4. Unless otherwise specified hinges must have concealed ball-bearings (combination anti-friction or oil impregnated).
      a. Standard doors must have non-rising pins.
      b. Doors exposed to the public, and other secure areas, must have non-removable pins.
   5. Electric Hinges: Provide hinges with electrified options as scheduled in the hardware sets. Coordinate voltage and other electrical requirements with applicable portions of Division 26 “Electrical”.
   6. Width of hinges: 4 ½ inches. Adjust hinge width as required for door, frame and wall conditions to allow proper degree of opening.

C. Pivots
   1. Provide quantities and types of pivots (offset, intermediate and center) as required to suit door sizes and weights.
   2. Pivot sets (offset and center) must consist of top and bottom pivots, unless otherwise indicated.
   3. Provide a top pivot for each floor closer unless otherwise indicated.

2.4 CONTINUOUS HINGES

A. Provide aluminum geared hinges.
   1. Basis-of-Design Product, for aluminum geared hinges: Subject to compliance with requirements, provide Best (BE) or comparable product by one of the following:
      a. Zero,
      b. Ives,
      c. Or approved equal.

   2. Requirements:
      a. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.25, Grade 2.
      b. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6023-T6 aluminum, with 0.25-inch (6 mm) diameter Teflon coated stainless steel hinge pin.
      c. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
      d. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
      e. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware.
      f. Install hinges with fasteners supplied by manufacturer.
      g. Provide hinges with symmetrical hole pattern.

2.5 CLOSERS

A. Basis-of-Design Product, for Surface Mounted Door Closers: Subject to compliance with requirements, provide Best (BE) QDC series or comparable product by one of the following:
   1. LCN, 40 series.
   2. Sarjeant, 281 series.
   3. Or approved equal.

B. Basis-of-Design Product, for Concealed Door Closers: Subject to compliance with requirements, provide Dormakaba (DM) series or comparable product by one of the following:
   1. LCN,
   2. Ives,
   3. Sarjeant
   4. Or approved equal.

C. Unless otherwise indicated, closers must not be visible on the public side of doors. Closers opening into public spaces must be provided with parallel arms and brackets to suit.

D. Closers must be sized in accordance with the accepted manufacturer's standards to suit height, width, weight of door and draft conditions.

2.6 LOCKING AND LATCHING DEVICES

A. Sole Source product: Best (BE) 7KC series
   1. No Substitutions Permitted.

B. Mechanical: Provide types, functions, as specified. Coordinate with Commissioner for keying requirements.

2.7 KEYS AND KEYING

A. Provide three (3) keys for each differently keyed lock. Unless otherwise indicated, locks must be keyed differently.

B. Final keying requirements will be determined by the Commissioner.

C. Quantity: Furnish in the following quantities.
   1. Change (Day) Keys: 3 per cylinder/core.
   2. Permanent Control Keys: 3.
   3. Master Keys: 6.

2.8 DOOR STOPS

A. Basis-of-Design Product, for Door Stops: Subject to compliance with requirements, provide Trimco (TR) series or comparable product by one of the following:
   1. LCN 40 series,
   2. Ives series,
   3. Or approved equal.

B. Size overhead stops to suit door width, height, weight and draft condition.

C. Overhead stops must have extruded architectural bronze tracks with a built-in shock absorber. The arm must be hard-drawn brass.

D. Stops: Provide stops to limit the degree of opening, helping to prevent damage to adjacent walls, columns, equipment, the door or its hardware.

E. Floor Stops: All stops to be fastened to concrete must use expansion shields and machine screws.

2.9 EXIT DEVICES

A. Sole Source product: Von Duprin 98/99 series
   1. No Substitutions Permitted.

B. Requirements:
   1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1, and UL listed for Panic Exit or Fire Exit Hardware. Cylinders: Refer to “KEYING” article, herein.
   2. Provide exit devices with manufacturer’s approved strikes.

3. Provide exit devices cut to door width and height. Locate exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Commissioner.
4. Mount mechanism case flush on face of doors, or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
5. Provide hex-key dogging at non-fire-rated exit devices, unless specified less dogging.
6. Where lever handles are specified as outside trim for exit devices, provide heavy-duty lever trims with forged or cast escutcheon plates. Provide vandal-resistant levers that will travel to 90-degree down position when more than 35 pounds of torque are applied, and which can easily be re-set.
7. Lever Style: Match lever style of locksets.
8. Tactile Warning (Knurling): Where required by NYC DOB. Provide on levers on exterior (secure side) of doors serving rooms considered to be hazardous.
9. Provide UL labeled fire exit hardware for fire rated openings.
10. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
11. Provide electrified options as scheduled.

2.10 SILENCERS & GASKETING

A. Basis-of-Design Product, for Silencers and Gaskets: Subject to compliance with requirements, provide Trimco (TR) series or comparable product by one of the following:
   1. Haffelle
   2. Richelieu
   3. Or approved equal.

B. Silencers: Provide silencers for all non-gasketed and non-weather-stripped frames. Provide three (3) for each single swing door and two (2) for each pair of doors.

2.11 THRESHOLDS & ACOUSTIC SEALS

A. Basis-of-Design Product, for Thresholds and Acoustic Seals: Subject to compliance with requirements, provide National Guard products (NGP) series or comparable product by one of the following:
   1. Pemko.
   2. Zero International.
   3. Or approved equal.

B. Requirements:
   1. Provide thresholds, weatherstripping (including door sweeps, seals, astragals) and gasketing systems (including sound, and light) as specified.
   2. Size of thresholds:
      a. Saddle Thresholds: 1/2 inch (13 mm) high by jamb width by door width
      b. Bumper Seal Thresholds: 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width

2.12 ELECTRIC STRIKES

A. Sole Source product: Von Duprin (VD) 6200 series
   1. No Substitutions Permitted

2.13 DOOR TRIM-PULLS

A. Basis-of-Design Product, for Door Trim-Pulls: Subject to compliance with requirements, provide ASSA Abloy, Rockwood or comparable product by one of the following:
   1. Ives.
   2. Emtek.
   3. Or approved equal.

B. Requirements: Provide concealed fasteners where practical. Where exposed fasteners are required provide flush type finished to match push or pull.

2.14 DOOR CONTACTS

A. Sole Source product: Honeywell (HW) 4939SN-WH
   1. No Substitutions Permitted

2.15 AUTOMATIC ENTRY CONTROLS

A. Basis-of-Design Product, for Automatic Entry Controls: Subject to compliance with requirements, provide Security Door Controls or comparable product by one of the following:
   1. Ives.
   2. Emtek.
   3. Or approved equal.

B. Provide complete system of back boxes, wiring, and face plates.

C. Exterior Requirements: Bollard Mounted, wireless, 6-3/4” x 6-3/4” x 2-1/8 for double gang box mount flush mount bracket with weather-resistant gasket.

D. Interior Requirements; Wall Mounted, wireless 2-3/4” x 4 ½” for single gang box flush mounted.

E. Key Switch: Bollard mounted, 2-7/8” x 4 ½” flush mounted single gang 20 gauge stainless-steel tamper resistant recessed cylinder.

2.16 FINISHES

A. Provide finish hardware with the BHMA and USD finishes as scheduled.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION, GENERAL

A. Make periodic checks during construction in order to ascertain that the finish hardware furnished has been installed correctly. After completion of all construction work, adjust finish hardware to work properly; test all keys and adjust as required for smooth, free operation.

3.3 HARDWARE SETS

A. Abbreviations:
1. BE- Best
2. ST-Stanley
3. VD-Von Duprin
4. TR- Tremco
5. NGP- National Guard Products
6. HW- Honeywell
7. SDC-Security Key Controls
8. DM- Dormakaba

B. Manufacturers listed below are basis of design only. See Part 2 for additional manufacturer's and approved equal.

C. SET #01 – (001, 101)

each opening to have:

			FINISH	BOD Mfr
3	Hinges	FBB179 4 1/2 x 4 1/2	26D	ST
1	Storeroom Lock	9K-7-3-D-16-K	626	BE
1	Electric Strike	6211	US33	VD
1	Closer	QDC 111	689	BE
1	Floor Stops	1211	626	TR
1	Door Contact	9540		RC
1	Gasketing	5050 B @ HEAD AND JAMBS		NGP
1	Card Reader	By Security Vendor		

D. SET #01a – (009)

each opening to have:

3 Hinges	FBB179 4 1/2 x 4 1/2	26D	ST
1 Storeroom Lock	9K-7-3-D-16-K	626	BE
1 Electric Strike	6211	US33	VD
1 Floor Stops	1211	626	TR
1 Door Contact	4939SN-WH		HW
1 Gasketing	5050 B @ HEAD AND JAMBS		NGP
1 Card Reader	By Security Vendor		

E. SET #02 – (003, 007, 012, 013, 008)
each opening to have:

3 Hinges	FBB179 4 1/2 x 4 1/2	26D	ST
1 Storeroom Lock	9K-7-3-D-16-K	626	BE
1 Closer	QDC 111	689	BE
1 Floor Stop	1211	626	TR
1 Acoustic Seal	107S @ HEAD AND JAMBS		NGP

F. SET #02a – (011)
each opening to have:

3 Hinges	FBB179 4 1/2 x 4 1/2	26D	ST
1 Storeroom Lock	9K-7-3-D-16-K	626	BE
1 Floor Stop	1211	626	TR
1 Acoustic Seal	107S @ HEAD AND JAMBS		NGP

G. SET #03 – (102,016)
each opening to have:

3 Hinges	FBB179 4 1/2 x 4 1/2	26D	ST
1 Storeroom Lock	9K-7-3-D-16-K	626	BE
1 Closer	QDC 111	689	BE
1 Floor Stops	1211	626	TR
1 Gasketing	5050 C @ HEAD AND JAMBS		NGP

H. SET #04 – (004, 005, 006, 104)
each opening to have:

3 Hinges	FBB179 4 1/2 x 4 1/2	26D	ST
1 Privacy Lock	9K-0-3-L-16-K	626	BE
1 Closer	QDC 111	689	BE
1 Floor Stop	1211	626	TR
1 Silencers	1229A		TR
1 Coat Hook	3072	630	TR

I. SET #04a – (105)
each opening to have:

3 Hinges	FBB179 4 1/2 x 4 1/2	26D	ST
1 Privacy Lock	7KC-0-3-L-16-K	626	BE
1 Floor Stop	1211	626	TR

1	Silencers 1229A		TR
1	Coat Hook 3072	630	TR

J. SET #05 –NOT USED

K. SET #06 – (010, 103)
each opening to have:

3	Hinges FBB179 4 1/2 x 4 1/2	26D	ST
1	Entrance Lock 9K-7-3-AB-16-K	626	BE
1	Floor Stop 1211	626	TR
1	Gasketing 5050 C @ HEAD AND JAMBS		NGP

L. SET #07 – (014)
each opening to have:

6	Hinges FBB179 4 1/2 x 4 1/2	26D	ST
1	Electric Hinge CEFBB179-58 4 1/2 x 4 1/2	26D	ST
1	Auto Flush Bolts 3810 X 3810	626	TR
1	Electric Lock 9K-7-3-DEU-16-K	626	BE
1	Coordinator 3094 x LENGTH AS REQUIRED	PC	R
1	Dustproof Strike 3910	630	TR
2	Floor Stops 1211	626	TR
1	Meeting Astragal 5070 CL x HEIGHT AS REQUIRED		NGP
1	Acoustic Seal 107S @ HEAD AND JAMBS		NGP
1	Door Contact 4939SN-WH		HW
1	Card Reader By Security Vendor		

M. SET #08 – (015) each opening to have:

3	Hinges FBB169 5” x 4 ½	26D	ST
1	Storeroom Lock 9K-7-3-D-16-K	626	BE
1	Electric Strike 6211	US33	VD
1	Closer QDC 11	689	BE
1	Floor Stops 1211	626	TR
1	Acoustic Seal 107S @ HEAD AND JAMBS		NGP
1	Door Contact 4939SN-WH		HW
1	card reader by Security Vendor		

N. SET #09 – (EX3)
each opening to have:

3	Hinges FBB191 4 1/2 x 4 1/2	630	ST
1	Exit Device CX-98-L-M996-FSE	626	VD
1	Power Transfer EPT-12C	689	PR
1	Closer QDC 111	693	BE
1	Floor Stops 1211	626	TR
1	Gasketing 5050 C @ HEAD AND JAMBS		NGP
1	Door Contact 4939SN-WH		HW
1	Thermal Saddle 8428	AL	NGP
2	Card Reader By Security Vendor		

O. SET #10 – (107A)
each opening to have:

3	Hinges	FBB179 4 1/2 x 4 1/2	26D	ST
1	Exit Device	98L-F-BE	626	VD
1	Closer	QDC 111	689	BE
1	Floor Stops	1211	626	TR
1	Gasketing	5050 C @ HEAD AND JAMBS		NGP
1	Mag Hold	EM508 (@107A)	626	TR

P. SET #11 – (EX2)
each opening to have:

3	Hinges	FBB191 4 1/2 x 4 1/2	630	ST
1	Exit Device	CX-98-L-M996-FSE	626	VD
1	Power Transfer	EPT-12C	689	PR
1	Power Supply	PS902		VD
1	Closer	QDC 111	693	BE
1	Floor Stops	1211	626	TR
1	Gasketing	5050 C @ HEAD AND JAMBS		NGP
1	Door Contact	4939SN-WH		HW
1	Thermal Saddle	8428	AL	NGP

Q. SET #11a – (EX1)
each opening to have:

3	Hinges	FBB191 4 1/2 x 4 1/2	630	ST
1	Exit Device	98-L-NL	626	VD
1	Closer	QDC 111	693	BE
1	Floor Stops	1211	626	TR
1	Gasketing	5050 C @ HEAD AND JAMBS		NGP
1	Door Contact	4939SN-WH		HW
1	Thermal Saddle	8428	AL	NGP
1	Door Pull	RM4820	32D	Rockwood

R. SET #12 – (108) each opening to have:

2	Continuous Hinge	662HD EPT	26D	BE
2	Exit Device	EL RX 9847L-F-LBR	626	VD
2	Power Transfer	EPT-12C	689	PR
1	Concealed Closer	ITS9613 INV	689	DM
1	Automatic Door Closer	ED100eLE	689	DM
1	Gasketing	5050 C @ HEAD AND JAMBS		NGP
1	Door Contact	9540		RC
1	Thermal Saddle	8428	AL	NGP
1	Pull	RM300 (71”)	629/32	Rockwood
1	Recessed Push to Open Actuator (Exterior)	482B4U	630	SDC
1	Exterior Gasket	480-4FB		SDC
1	Recessed Push to Open Actuator (Interior)	48201U		SDC
1	Recessed Key Switch		701U	SDC
1	Key Cylinder	CYL-6KAQ		SDC

1 After hours access reader By Security Vendor

S. SET #12a – (107)
each opening to have:

2	Continuous Hinge 662 HD EPT	26D	BE
2	Exit Device EL RX 9847L-F-LBR	626	VD
2	Concealed Closer ITS9613 INV	689	DM
1	Gasketing 5050 C @ HEAD AND JAMBS		NGP
1	Door Contact 4939SN-WH		HW
1	NLOP (key access for staff)		
1	Pull RM300 (71")	629/32	Rockwood

T. SET #13 – (012A)
each opening to have:

3	Hinges FBB191 5" x 4 1/2	26D	ST
1	Exit Device CX-98-L-F-M996-FS	626	VD
1	Power Supply PS902		VD
1	Power Transfer EPT-12C	689	PR
1	Electric Strike 0162	630	RC
1	Closer QDC 111	689	BE
1	Floor Stop 1211	626	TR
1	Mag Hold EM508	626	TR
1	Gasketing 5050 C @ HEAD AND JAMBS		NA
1	Card Reader By Security Vendor		

U. SET #14 – (M01)
each opening to have:

3	Hinges FBB179 4 1/2" x 4 ½"	26D	ST
1	Passage Lock 9K-0-3-N-16-K	626	BE
1	Closer QDC 111	689	BE
1	Floor Stop 1211	626	TR
1	Gasketing 5050 C @ HEAD AND JAMBS		NA

V. SET #15 – (M01A)
each opening to have:

1	Continuous Hinge 662HD	26D	BE
1	Storeroom Lock9K-7-3-D-16-K	626	BE
1	Electric Strike L6504 LMKM	630	RC
1	Closer QDC 111	689	BE
1	Floor Stop 1211	626	TR
1	Gasketing 5050 C @ HEAD AND JAMBS		NA
1	Door Contact 4939SN-WH		HW

W. SET #16 – (018)
each opening to have:

3	Hinges FBB168 5" x 4 1/2	26D	ST
1	Exit Device 98L-F-LBR	626	VD
1	Electric Strike 0162	630	RC

1	Closer	QDC 111	689	BE
1	Floor Stop	1211	626	TR
1	Gasketing	5050 C @ HEAD AND JAMBS		NA
1	Card Reader	By Security Vendor		

END OF SECTION 08 71 00

SECTION 08 80 00 – GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Glass for windows, doors and curtain walls.
2. Glass for interior glass wall assemblies.
3. Glazing sealants.
4. Installation accessories.

1.3 DEFINITIONS

A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.

C. Interspace: Space between lites of an insulating-glass unit.

1.4 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Product Data: For sealants, indicating VOC content.

2. Laboratory Test Reports: For sealants, indicating compliance with requirements for low-emitting materials.

C. Engineering Services Submittal: For glass, submit design calculations sealed and signed by the qualified Contractor's Professional Engineer, licensed in the State of New York, responsible for their preparation.

1. Engineering services documentation will be submitted to Commissioner for review and approval prior to any incorporation into the work.

D. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches square.

E. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.7 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of glass.

B. Product Test Reports: For coated glass, insulating glass, and glazing sealants, for tests performed by a qualified testing agency.

1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.

C. Preconstruction adhesion and compatibility test report.

D. Sample Warranties: For special warranties.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

C. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for materials and execution.

1. Install glazing in mockups specified in Section 084413 "Glazed Aluminum Curtain Walls" and other sections, to match glazing systems required for Project, including glazing methods.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 PRECONSTRUCTION TESTING

A. Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.

1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.
2. Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
3. Test no fewer than eight Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.
4. Schedule enough time for testing and analyzing results to prevent delaying the Work.
5. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures including the use of specially formulated primers.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.11 FIELD CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F.

1.12 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: 10 years from date of Substantial Completion.

B. Manufacturer's Special Warranty on Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass

breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1. Warranty Period: 10 years from date of Substantial Completion.

C. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.

B. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

2.2 PERFORMANCE REQUIREMENTS

A. Engineering Services: Engage a qualified Professional Engineer licensed in the State of New York to design glass for project application.

1. Engineering Services will include complete design calculations for glass required for this project.

a. Indicate required design loads, including live loads, wind loads, seismic loads, and dead loads and handling stresses during shipment and erection including loads from construction procedures.
b. Design calculations will be based on Performance Requirements and product design criteria indicated.

B. General: Installed glazing systems will withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

C. Structural Performance: Glazing will withstand the following design loads within limits and under conditions indicated determined according to the 2014 New York City Building Code and ASTM E1300.

1. Design Wind Pressures: As indicated on Drawings.
2. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

E. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

1. U-Factors: Center-of-glazing values, according to NFRC 100 and based on computed analysis, expressed as Btu/sq. ft. x h x deg F.

   a. U Value: 0.35.

2. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on accredited data.

   a. Solar Heat-Gain Coefficient: 0.37.

3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

   a. 70 percent.

2.3 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC. Label will indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.

E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

A. Clear Annealed Float Glass: ASTM C1036, Type I, Class 1 (clear), Quality-Q3.

B. Ultraclear, Low- iron Float Glass: ASTM C 1036, Type I, Class I (clear), Quality-Q3; and with visible light transmission of not less than 91 percent and solar heat gain coefficient of not less than 0.87.

C. Low- Emissivity (Low- e) Glass: Pyrolytically coated clear Low- e coated glass.

D. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

2.5 LAMINATED GLASS

A. Laminated Glass: ASTM C 1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.

1. Construction: Laminate glass with polyvinyl butyral interlayer, ionomeric polymer interlayer or cast-in-place and cured-transparent-resin interlayer to comply with interlayer manufacturer's written instructions.
2. Interlayer Thickness: Provide thickness not less than that indicated and needed to comply with requirements.
3. Interlayer Color: As indicated in Part 3 schedule.

2.6 INSULATING GLASS

A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, argon filled, qualified according to ASTM E2190.

1. Sealing System: Dual seals, with manufacturer's standard primary and secondary sealants.
2. Perimeter Spacer: Manufacturer's standard spacer material and construction.

B. Basis of Design Products: Subject to compliance with requirements, provide insulated glass as manufactured by Viracon or comparable product by one of the following:

1. Oldcastle Building Envelope.
2. Vitro (formerly PPG)
3. Or approved equal.

C. Ceramic-Coated Vision Glass: ASTM C1048, Condition C, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3; and complying with Specification No. 95-1-31 in NGA's "Engineering Standards Manual."

1. Patterns: As scheduled.

2.7 GLAZING SEALANTS

A. General:

1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Colors of Exposed Glazing Sealants: As selected by Commissioner from manufacturer's full range.

B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C920, Type S, Grade NS, Class 100/50, Use NT.

C. Sealant must comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.8 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.
2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.9 MISCELLANEOUS GLAZING MATERIALS

A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

B. Setting Blocks:

1. Neoprene with a Shore A durometer hardness of 85, plus or minus 5.
2. Type recommended by sealant or glass manufacturer.

C. Spacers:

1. Neoprene blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
2. Type recommended by sealant or glass manufacturer.

D. Edge Blocks:

1. Neoprene with a Shore A durometer hardness per manufacturer's written instructions.
2. Type recommended by sealant or glass manufacturer.

E. Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep systems.
3. Minimum required face and edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.4 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

F. Provide spacers for glass lites where length plus width is larger than 50 inches.

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

3.5 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Apply heel bead of elastomeric sealant.

F. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

G. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.6 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.7 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure.

1. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.8 CLEANING AND PROTECTION

A. Immediately after installation remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

3.9 GLASS SCHEDULE

A. Manufacturer's listed in schedule are basis of design only. See PART 2-PRODUCTS for additional manufacturers or approved equal.

B. GL-1:

1. 1/2" + 1/16" +1/2" Laminated Glass.
2. Acid etched in area noted
3. Location: Bridge.

C. GL-2:

1. 3/8" thick Tempered Glass.
2. Location: YALP classroom.

D. GL-3:

1. 1/4" thick Tempered Glass.
2. Location: Interior glass doors.

E. GL01:

1. 1" thick Insulated Glass Units.
2. Composition: 1/4" heat soak Viracon VE1-2M#2, 1/4" heat soak, argon filled black spacer.
3. Location: Exterior vestibule entry, replacement windows.

F. GL02:

1. 1-1/8" thick Insulated Glass Units.
2. Composition: 5/16" heat soak Viracon VE1-2M#2 5/16" heat soak, argon filled light grey frit 60% black spacer.
3. Frit Pattern 1: Light Gray Screen 2050.
4. Location: Addition South Façade.

G. GL03:

1. 1-1/8" thick Insulated Glass Units.
2. Composition: 5/16" heat soak Viracon VE1-2M#2 5/16" heat soak, argon filled light grey frit 20% black spacer.
3. Frit Pattern GL03.1: Light Grey Frit 2050.
4. Frit Patten GL03.1b: As scheduled.

5. Frit Patten GL03.2: Light Grey Screen 2973.
6. Frit Patten GL03.3: Light Grey Frit 2256
7. Location: Addition South Façade.

END OF SECTION 08 80 00

SECTION 08 81 26 – INTERIOR GLASS GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Interior all-glass partitions with butted glass joints and set in aluminum top and bottom tracks.
2. Anchorages, shims, fasteners, accessories, and support brackets.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product data including construction details, material descriptions, fabrication methods, dimensions of individual components and profiles, hardware, finishes, and operating instructions for each type of aluminum entrance and storefront indicated.

B. Shop Drawings: For metal-framed systems. Include plans, elevations, sections, details, and attachments to work of other trades.

1. Include details of provisions for system expansion and contraction.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

E. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed systems, made from 12 inch lengths of full-size components and showing details of the following:

1. Joinery, including concealed welds.
2. Anchorage.
3. Expansion provisions.
4. Glazing.

F. Certificates: Submit certificates showing compliance with performance and Building Code requirements.

G. Test Reports: Submit material and product test reports showing compliance with performance and Building Code requirements.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.2, "Structural Welding Code - Aluminum."

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of aluminum-framed systems that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Arch Aluminum & Glass Co., Inc.
2. Blumcraft of Pittsburgh; C.R. Laurence Co, Inc.
3. C.R. Laurence.
4. Or approved equal.

2.2 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

1. Sheet and Plate: ASTM B 209.
2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.

B. Glazing: Comply with requirements of ASTM C 1048 for kind FT (fully tempered) and ASTM C 1172 for laminated glass.

1. Thickness: 1/2 inch, unless otherwise indicated.

2. Comply with reference standards, performance and materials property requirements as specified in Section 08 80 00 “Glazing.”

C. Steel Reinforcement: Complying with ASTM A 36 for structural shapes, plates, and bars; ASTM A 1008 for cold-rolled sheet and strip; or ASTM A 1011 for hot-rolled sheet and strip.

D. Joint Sealants: Provide silicone sealants approved by the manufacturer of the system, complying with ASTM C920, and Section 07 92 00 “Joint Sealants.”

1. Butt-Glazing Sealants: Single-Component, Nonsag, Acid-Curing Silicone Joint Sealant complying with ASTM C 920, Type S, Grade NS, Class 25, for Uses NT, G, and A.

E. Gaskets:

1. Dense Compression Gaskets: Molded or extruded gaskets.

a. Neoprene complying with ASTM C 864.
b. EPDM complying with ASTM C 864.
c. Silicone complying with ASTM C 1115.
d. Thermoplastic polyolefin rubber complying with ASTM C 1115.

2. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned neoprene, EPDM or silicone gaskets; ASTM C 509, Type II.

F. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.

2.3 ALL-GLASS SYSTEM COMPONENTS

A. Framing and Support Members: Manufacturer's standard Stainless steel-clad aluminum members of thickness required and reinforced as required to support imposed loads

B. Fitting Configuration:

1. Top and Bottom Channels/Support: Concealed flush mounted.

a. Material: Aluminum U-tracks.
b. Dimensions: As indicated on the Drawings.

2.4 FASTENERS, BRACKETS, AND ACCESSORIES

A. Brackets and Reinforcements: Manufacturer's standard high-strength stainless steel with nonstaining, nonferrous shims for aligning system components.

B. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements or vibration.
2. Reinforce members as required to receive fastener threads.

3. Use exposed fasteners with countersunk Phillips screw heads, fabricated from stainless steel.

C. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts, complying with ASTM A 123 or ASTM A 153.

D. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30-mil thickness per coat.

2.5 FABRICATION

A. General: Fabricate components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

1. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
2. Fasteners, anchors, and connection devices will be concealed from view to greatest extent possible

B. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Glazing: Fabricate glazing to sizes required with edge clearances and tolerances that comply with manufacturer's recommendations.

1. Provide holes and cutouts in glass to receive hardware, fittings, and accessory fittings before tempering glass. Do not cut, drill, or make other alterations to glass after tempering.
2. Fully temper glass using horizontal (roller-hearth) process, and fabricate so that when glass is installed, roll-wave distortion is parallel with bottom edge of door or lite.

2.6 ALUMINUM FINISHES

A. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work. Notify the Commissioner in writing of conditions unsatisfactory for installation.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. General: Install assemblies in accordance with manufacturer's instructions and approved shop drawings, using workers specifically trained in the installation of this type of work.

B. Set units plumb, level, and true to line, without warp or rack of framing members. Install components in proper alignment and relation to established lines and grades. Provide proper support and anchor securely in place.

C. Glazing: Install glazing as specified in Section 08 80 00 "Glazing."

D. Install joint sealants as specified in Section 07 92 00 "Joint Sealants" and in accordance with manufacturer's instructions for each sealant type and application.

3.4 ERECTION TOLERANCES

A. Install aluminum-framed systems to comply with the following maximum erection tolerances:

1. Location and Plane: Limit variation from true location and plane to 1/8 inch in 12 feet; 1/4 inch over total length.
2. Alignment:

    a. Where surfaces abut in line, limit offset from true alignment to 1/16 inch.
    b. Where surfaces meet at corners, limit offset from true alignment to 1/32 inch.
    c. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch.

END OF SECTION 08 81 26

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 08 83 00 – MIRRORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Monolithic Low Iron glass mirrors (M2).
2. Film backed tempered glass mirrors qualifying as safety glazing.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1. Mirrors. Include description of materials and process used to produce each type of silvered flat glass mirror specified that indicates sources of glass, glass coating components, edge sealer, and quality-control provisions.

B. Sustainable Design Submittals:

1. Product Data: For adhesives, indicating VOC content.
2. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.

C. Shop Drawings: Include mirror elevations, edge details, mirror hardware, and attachments to other work.

D. Samples: For each type of the following products:

1. Mirrors: 4 inches square, including edge treatment on all four edges.
2. Mirror Trim: 4 inches long.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Product Certificates: For each type of mirror and mirror mastic, from manufacturer.

C. Preconstruction Test Reports: From mirror manufacturer indicating that mirror mastic was tested for compatibility and adhesion with mirror backing paint film and substrates on which mirrors are installed.

D. Warranty: Sample of special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For mirrors to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.

C. Source Limitations for Mirrors: Obtain mirrors from single source from single manufacturer.

D. Source Limitations for Mirror Accessories: Obtain mirror glazing accessories from single source.

E. Glazing Publications: Comply with the following published recommendations:

1. GANA's "Glazing Manual" unless more stringent requirements are indicated. Refer to this publication for definitions of glass and glazing terms not otherwise defined in this Section or in referenced standards.
2. GANA Mirror Division's "Mirrors, Handle with Extreme Care: Tips for the Professional on the Care and Handling of Mirrors."

F. Safety Glazing Products: For film-backed tempered mirrors, provide products complying with testing requirements in 16 CFR 1201 for Category II materials.

G. Preconstruction Mirror Mastic Compatibility Test: Submit mirror mastic products to mirror manufacturer for testing to determine compatibility of mastic with mirror backing paint film and substrates on which mirrors are installed.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect mirrors according to mirror manufacturer's written instructions and as needed to prevent damage to mirrors from moisture, condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with mirror manufacturer's written instructions for shipping, storing, and handling mirrors as needed to prevent deterioration of silvering, damage to edges, and abrasion of glass surfaces and applied coatings. Store indoors.

1.9 PROJECT CONDITIONS

A. Environmental Limitations: Do not install mirrors until ambient temperature and humidity conditions are maintained at levels indicated for final occupancy.

1.10 WARRANTY

A. Warranty: Manufacturer's standard form in which mirror manufacturer agrees to replace mirrors that deteriorate within specified warranty period. Deterioration of mirrors is defined as defects developed from normal use that are not attributed to mirror breakage or to maintaining and cleaning mirrors contrary to manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SILVERED FLAT GLASS MIRRORS (M2)

A. Glass Mirrors, General: ASTM C 1503; manufactured using copper-free, low-lead mirror coating process.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Arch Aluminum & Glass Co., Inc.
b. Avalon Glass and Mirror Company.
c. Binswanger Mirror; a division of Vitro America, Inc.
d. Or approved equal.

B. Clear Glass: Mirror Glazing Quality; Tempered ultraclear (low-iron) float glass with a minimum 91 percent visible light transmission.

1. Nominal Thickness: 6.0 mm or as indicated.
2. Mirror: (GL-10) As scheduled.

C. Safety Glazing Products: For film backed tempered mirrors provide products that comply with 16 CFR 1201, Category II.

2.2 MISCELLANEOUS MATERIALS

A. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

B. Edge Sealer: Coating compatible with glass coating and approved by mirror manufacturer for use in protecting against silver deterioration at mirrored glass edges.

C. Mirror Mastic: An adhesive setting compound, asbestos-free, produced specifically for setting mirrors and certified by both mirror manufacturer and mastic manufacturer as compatible with glass coating and substrates on which mirrors will be installed.

1. Adhesives must have a VOC content of 70 g/L or less.
2. Adhesive must comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Franklin International; Titebond Division.
   b. Laurence, C. R. Co., Inc.
   c. Macco Adhesives; Liquid Nails Division.
   d. Or approved equal.

D. Film Backing for Safety Mirrors: Film backing and pressure-sensitive adhesive; both compatible with mirror backing paint as certified by mirror manufacturer.

2.3 MIRROR HARDWARE

A. Top and Bottom Aluminum J-Channels: Aluminum extrusions with a return deep enough to produce a glazing channel to accommodate mirrors of thickness indicated and in lengths required to cover bottom and top edges of each mirror in a single piece.

1. Bottom Trim: J-channels formed with front leg and back leg not less than 3/8 and 7/8 inch in height, respectively, and a thickness of not less than 0.04 inch.

   a. Products: Subject to compliance with requirements, provide one of the following:

      1) Laurence, C. R. Co., Inc.; CRL Standard "J" Channel.
      2) Sommer & Maca Industries, Inc.; Aluminum Shallow Nose "J" Moulding Lower Bar.
      3) Sommer & Maca Industries, Inc.; Heavy Gauge Aluminum Shallow Nose "J" Moulding Lower Bar.
      4) Or approved equal.

2. Top Trim: J-channels formed with front leg and back leg not less than 5/8 and 1 inch in height, respectively, and a thickness of not less than 0.04 inch.

   a. Products: Subject to compliance with requirements, provide one of the following:

      1) Laurence, C. R. Co., Inc.; CRL Deep "J" Channel.
      2) Sommer & Maca Industries, Inc.; Aluminum Deep Nose "J" Moulding Upper Bar.
      3) Sommer & Maca Industries, Inc.; Heavy Gauge Aluminum Deep Nose "J" Moulding Lower Bar.
      4) Or approved equal.

3. Finish: Clear bright anodized

B. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture where fasteners are exposed.

C. Anchors and Inserts: Provide devices as required for mirror hardware installation. Provide toothed or lead-shield expansion-bolt devices for drilled-in-place anchors. Provide galvanized anchors and inserts for applications on inside face of exterior walls and where indicated.

2.4 FABRICATION

A. Mirror Sizes: To suit Project conditions, and before tempering, cut mirrors to final sizes and shapes.

B. Cutouts: Fabricate cutouts before tempering for notches and holes in mirrors without marring visible surfaces. Locate and size cutouts so they fit closely around penetrations in mirrors.

C. Mirror Edge Treatment: Flat polished edge of width shown.

1. Seal edges of mirrors with edge sealer after edge treatment to prevent chemical or atmospheric penetration of glass coating.
2. Require mirror manufacturer to perform edge treatment and sealing in factory immediately after cutting to final sizes.

D. Film-Backed Safety Mirrors: Apply film backing with adhesive coating over mirror backing paint as recommended in writing by film-backing manufacturer to produce a surface free of bubbles, blisters, and other imperfections.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, over which mirrors are to be mounted, with Installer present, for compliance with installation tolerances, substrate preparation, and other conditions affecting performance of the Work.

B. Verify compatibility with and suitability of substrates, including compatibility of mirror mastic with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected and surfaces are dry.

3.3 PREPARATION

A. Comply with mastic manufacturer's written installation instructions for preparation of substrates, including coating substrates with mastic manufacturer's special bond coating where applicable.

3.4 INSTALLATION

A. General: Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.

B. Provide a minimum air space of 1/8 inch between back of mirrors and mounting surface for air circulation between back of mirrors and face of mounting surface.

C. Wall-Mounted Mirrors: Install mirrors with mastic and mirror hardware. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrors.

1. Top and Bottom Aluminum J-Channels: Provide setting blocks 1/8 inch thick by 4 inches long at quarter points. To prevent trapping water, provide, between setting blocks, two slotted weeps not less than 1/4 inch wide by 3/8 inch long at bottom channel.
2. Top Channel/Cleat and Bottom Aluminum J-Channels: Fasten J-channel directly to wall and attach top trim to continuous cleat fastened directly to wall.
3. Mirror Clips: Place a felt or plastic pad between mirror and each clip to prevent spalling of mirror edges. Locate clips where indicated so they are symmetrically placed and evenly spaced.
4. Install mastic as follows:

a. Apply mastic to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrors and face of mounting surface.

3.5 CLEANING AND PROTECTION

A. Protect mirrors from breakage and contaminating substances resulting from construction operations.

B. Do not permit edges of mirrors to be exposed to standing water.

C. Maintain environmental conditions that will prevent mirrors from being exposed to moisture from condensation or other sources for continuous periods of time.

D. Wash exposed surface of mirrors not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash mirrors as recommended in writing by mirror manufacturer.

END OF SECTION 08 83 00

SECTION 08 91 19 - FIXED LOUVERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section includes:

1. Fixed extruded-aluminum louvers.
2. Louver screens.
3. Insulated blank-off panels for louvers.
4. Installation accessories.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.

B. Sustainable Design Submittals:

1. Environmental Product Declaration: For each product.
2. Health Product Declaration: For each product.
3. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.

C. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work, including surrounding aluminum curtain wall mullions at all sides of louver area. Show frame profiles and blade profiles, angles, and spacing.

D. Engineering Services Submittal: For louvers and connections, submit design calculations sealed and signed by the qualified Contractor's Professional Engineer, licensed in the State of New York, responsible for their preparation.

1. Engineering services documentation will be submitted to Commissioner for review and approval prior to any incorporation into the work.

E. Samples: For each type of metal finish required by project application.

1.5 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on evaluation of comprehensive tests performed according to AMCA 500-L by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver and showing compliance with performance requirements specified.

B. Sample Warranties: For manufacturer's special warranties.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Welding Qualifications: Qualify procedures according to AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.8 WARRANTY

A. Special Finish Warranty: Manufacturer agrees to restore or replace components on which finishes fail in materials or workmanship within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain fixed louvers from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.

2.2 PERFORMANCE REQUIREMENTS

A. Engineering Services: Engage a qualified Professional Engineer licensed in the State of New York to design louvers including connections.
1. Engineering Services will include complete design calculations for louvers and connections required for this project.
a. Indicate required design loads, including live loads, wind loads, seismic loads, and dead loads and handling stresses during shipment and erection including loads from construction procedures.
b. Design calculations will be based on Performance Requirements and product design criteria indicated.

B. Structural Performance: Louvers will withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver-blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures will be considered to act normal to the face of the building.

1. Wind Loads: Determine loads based on pressures as indicated on Drawings.

C. Seismic Performance: Louvers, including attachments to other construction, will withstand the effects of earthquake motions determined according to ASCE/SEI 7.

D. Louver Performance Ratings: Louvers will comply with requirements indicated, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

2.3 FIXED ALUMINUM LOUVERS

A. Vertical Extreme Weather Louvers:

1. Basis of Design Products: Subject to compliance with requirements, provide Model RS 2300 with 2 inch depth, as manufactured by Construction Specialties Inc., or a comparable product by one of the following:

a. Airolite Company, LLC.
b. Architectural Louvers; Harray, LLC.
c. Or approved equal.

2.4 LOUVER SCREENS

A. General: Provide screen at each exterior louver.

1. Screen Location for Fixed Louvers: Interior face.
2. Screening Type: Bird screening.

B. Louver Screen Frames: Same type and form of metal as indicated for louver to which screens are attached.

C. Louver Screening for Aluminum Louvers:

1. Bird Screening: Stainless steel, 1/2-inch-square mesh, 0.047-inch wire.

2.5 BLANK-OFF PANELS

A. Insulated Blank-Off Panels: Laminated panels consisting of an insulating core surfaced on back and front with metal sheets and attached to back of louver.

1. Size: As indicated on drawings.
2. Thickness: 3 inches, unless otherwise indicated.
3. Metal Facing Sheets: Aluminum sheet, not less than 0.032-inch nominal thickness.

4. Insulating Core: Rigid, glass-fiber-board insulation or extruded-polystyrene foam meeting project energy performance requirements.
5. Edge Treatment: Trim perimeter edges of blank-off panels with louver manufacturer's standard extruded-aluminum-channel frames, not less than 0.080-inch nominal thickness, with corners mitered and with same finish as panels.
6. Seal perimeter joints between panel faces and louver frames with gaskets or sealant.
7. Panel Finish: Same finish applied to louvers.

    a. Color and Gloss: As indicated on drawings.

8. Attach blank-off panels with clips or sheet metal screws.

2.6 MATERIALS

A. Aluminum Extrusions: ASTM B221, Alloy 6063-T5, T-52, or T6.

B. Aluminum Sheet: ASTM B209, Alloy 3003 or 5005, with temper as required for forming, or as otherwise recommended by metal producer for required finish.

C. Fasteners: Use types and sizes to suit unit installation conditions.

1. Use Phillips flat-head screws for exposed fasteners unless otherwise indicated.
2. For fastening aluminum, use aluminum or 300 series stainless-steel fasteners.
3. For fastening stainless steel, use 300 series stainless-steel fasteners.
4. For color-finished louvers, use fasteners with heads that match color of louvers.

D. Postinstalled Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, fabricated from stainless-steel components, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing according to ASTM E488/E488M conducted by a qualified testing agency.

E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

2.7 FABRICATION

A. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.

1. Join frame members to each other and to fixed louver blades with fillet welds concealed from view, unless otherwise indicated or size of louver assembly with bolted connections between frame members, to meet project performance requirements.

B. Fabricate louvers to accept curtain wall construction as indicated on drawings, with positive drainage from the rear of the louver to the exterior face of the building.

2.8 ALUMINUM FINISHES

A. High-Performance Organic Finish: Three-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Color and Gloss: As selected by the Commissioner from the manufacturer's full product line.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.4 INSTALLATION

A. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.

B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.

C. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.

D. Protect unpainted galvanized- and nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.

E. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Section 079200 "Joint Sealants" for sealants applied during louver installation.

F. Include louver frame and any metal backup framing and bracing required to support louvers per manufacturer instructions. Backup framing will be minimized and located to not conflict with

any mechanical plenums at louvers.

3.5 ADJUSTING AND CLEANING

A. Clean exposed louver surfaces that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.

B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.

C. Restore louvers damaged during installation and construction, so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Commissioner, remove damaged units and replace with new units.

1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 08 91 19

SECTION 09 21 16 - GYPSUM BOARD SHAFT WALL ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section includes:

1. Gypsum board shaft wall assemblies.
2. Installation accessories.

B. Related Sections:

1. Section 09 22 16 "Non-structural Metal Framing."
2. Section 09 29 00 "Gypsum Board."

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For each component of gypsum board shaft wall assembly.

B. Sustainable Design Submittals:

1. Environmental Product Declaration (EPD): For each product.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and support them on risers on a flat platform to prevent sagging.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Comply with gypsum-shaftliner-board manufacturer's written instructions.

B. Do not install finish panels until installation areas are enclosed and conditioned.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: Provide materials and construction identical to those of assemblies tested according to ASTM E 90 and classified according to ASTM E 413 by a testing and inspecting agency.

C. Framing Performance Characteristics: Gypsum board shaft-wall assemblies will withstand the design loads (air pressures) without failing and while maintaining an airtight and smoke-tight seal, as required by the 2014 New York City Building Code. Apply design loads transiently and cyclically under in-service conditions for maximum heights of partitions indicated. Evidence of failure includes deflections exceeding those indicated below, bending stresses causing studs to break or to distort, and end-reaction shear causing runners to bend or to shear and studs to become crippled.

1. Structural Criteria: Limiting heights of partitions are based on L/ 240 at 510 psi. Increase gage of steel framing to maintain above criteria while not increasing the thickness of partition.
2. Lateral Design Load: As indicated, but not less than 10 psf.
3. Deflection Limit: As indicated, but not more than 1/ 240 of partition height, unless otherwise indicated and required.
4. Seismic Characteristics, where required: Fabricate assemblies to comply with seismic load criteria, as required by the 2014 New York City Building Code.

2.2 GYPSUM BOARD SHAFT WALL ASSEMBLIES

A. Fire-Resistance Rating: As indicated.

B. STC Rating: As indicated.

C. Gypsum Shaftliner Board:

1. Moisture- and Mold-Resistant Type X: ASTM C 1396/C 1396M; manufacturer's proprietary fire-resistive liner panels with ASTM D 3273 mold-resistance score of 10 as rated according to ASTM D 3274, 1 inch thick, and with double beveled long edges.

a. Products: Subject to compliance with requirements, provide one of the following:

1) CertainTeed Corporation; ProRoc Moisture and Mold Resistant Shaftliner.
2) Continental Building Products, LLC; Mold Defense Shaftliner Type X.
3) Georgia-Pacific Gypsum LLC; Dens-Glass Ultra Shaftliner.
4) National Gypsum Company; Gold Bond Brand Fire-Shield Shaftliner XP.
5) USG Corporation; Sheetrock Brand Mold Tough Gypsum Liner Panel.
6) Or approved equal.

D. Non-Load-Bearing Steel Framing, General: Complying with ASTM C 645 requirements for metal unless otherwise indicated and complying with requirements for fire-resistance-rated assembly indicated.

1. Protective Coating: Refer to Section 09 22 16 "Non-Structural Metal Framing."

E. Studs: Manufacturer's standard profile for repetitive, corner, and end members as follows:

1. Depth: As indicated.
2. Minimum Base-Metal Thickness: As indicated and required by project performance requirements.

F. Runner Tracks: Manufacturer's standard J-profile track with manufacturer's standard long-leg length, but at least 2 inches long and matching studs in depth.

1. Minimum Base-Metal Thickness: Matching steel studs.

G. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

1. Refer to Section 09 29 00 "Non- structural Metal Framing."

H. Elevator-Hoistway-Entrance Struts: Manufacturer's standard J-profile jamb strut with long-leg length of 3 inches, matching studs in depth, and not less than 0.033 inch thick.

I. Finish Panels: Gypsum board, refer to Section 09 29 00 "Gypsum Board."

J. Sound Attenuation Blankets: Refer to Section 09 29 00 "Gypsum Board."

2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with shaft wall manufacturer's written instructions.

B. Trim Accessories: Refer to Section 09 29 00 "Gypsum Board." Cornerbead, edge trim, and control joints of material and shapes that comply with gypsum board shaft wall assembly manufacturer's written instructions for application indicated.

C. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.

D. Track Fasteners: Power-driven fasteners of size and material required to withstand loading conditions imposed on shaft wall assemblies without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.

1. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488/E 488M conducted by a qualified testing agency.
2. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency

E. Reinforcing: Galvanized-steel reinforcing strips with 0.033-inch minimum thickness of base metal (uncoated).

F. Acoustical Sealant: Refer to Section 09 29 00 "Gypsum Board."

G. Gypsum Board Cants:

1. Gypsum Board Panels: Refer to Section 09 29 00 "Gypsum Board.".
2. Laminating adhesive: Refer to Section 09 29 00 "Gypsum Board."
3. Non-Load-Bearing Steel Framing: Refer to Section 09 22 16 "Non-Structural Metal Framing."

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 FIELD QUALITY CONTROL

A. Special Inspections: City of New York will engage a qualified inspector to perform the following progress inspections.

1. Fire-resistant rated construction

B. Where deficiencies are found, restore or replace through-penetration firestop systems so they comply with requirements.

3.3 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.4 PREPARATION

A. Sprayed Fire-Resistive Materials: Coordinate with gypsum board shaft wall assemblies so both elements of Work remain complete and undamaged. Patch or replace sprayed fire-resistive materials removed or damaged during installation of shaft wall assemblies to comply with requirements specified in Section 07 81 00 "Applied Fireproofing."

B. After sprayed fire-resistive materials are applied, remove only to extent necessary for installation of gypsum board shaft wall assemblies and without reducing the fire-resistive material thickness below that which is required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

3.5 INSTALLATION

A. General: Install gypsum board shaft wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated and manufacturer's written installation instructions.

B. Do not bridge building expansion joints with shaft wall assemblies; frame both sides of expansion joints with furring and other support.

C. Install supplementary framing in gypsum board shaft wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, wall-mounted door stops, and similar items that cannot be supported directly by shaft wall assembly framing.

1. Elevator Hoistway: At elevator hoistway-entrance door frames, provide jamb struts on each side of door frame.
2. Reinforcing: Provide where items attach directly to shaft wall assembly as indicated on Drawings; accurately position and secure behind at least one layer of face panel.

D. Penetrations: At penetrations in shaft wall, maintain fire-resistance rating of shaft wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons and floor indicators, and similar items.

E. Isolate perimeter of gypsum panels from building structure to prevent cracking of panels while maintaining continuity of fire-rated construction.

F. Firestop Tracks: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.

G. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Commissioner while maintaining fire-resistance rating of gypsum board shaft wall assemblies.

H. Sound-Rated Shaft Wall Assemblies: Seal gypsum board shaft walls with acoustical sealant at perimeter of each assembly where it abuts work of other trades and at joints and penetrations within each assembly.

I. Gypsum Board Cants: At projections into shaft exceeding 4 inches where indicated, install gypsum board cants covering tops of projections.

1. Slope cant panels at least 75 degrees from horizontal. Set base edge of panels in adhesive and secure top edges to shaft walls at 24 inches o.c. with screws fastened to shaft wall framing.
2. Where non-load-bearing steel framing is required to support gypsum board cants, install framing at 24 inches o.c. and extend studs from the projection to shaft wall framing.

J. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.6 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, or mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 21 16

SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing systems for interior partitions.
2. Suspension systems for interior ceilings and soffits.
3. Grid suspension systems for gypsum board ceilings.

B. Related Sections:

1. Section 09 21 16 “Gypsum Board Shaft Wall Assemblies.”
2. Section 09 29 00 “Gypsum Board.”

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures.”

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of code-compliance certification for studs and tracks.

B. Evaluation Reports: For firestop tracks and post-installed anchors, from ICC-ES or other qualified testing agency acceptable to New York City Department of Buildings and New York City Fire Department.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

C. Metal framing assemblies will be capable of withstanding following lateral design loadings for maximum heights of partitions without failing. Evidence of failure includes deflections exceeding limits indicated, bending stresses causing studs to break or to distort, and end reaction shear causing track (runners) to bend or to shear and studs to become crippled. Comply with SA923 of United States Gypsum Company and as required by the 2014 New York City Building Code.

1. Lateral Loading, Partition, Furring and Other Assemblies: 5.0 psf, unless otherwise indicated.
2. Deflection Limits, Painted Assemblies: 1/360 of partition height.
3. Deflection Limits, Tile and Other Hard Finish Surfaces: 1/360 of partition height.

2.2 FRAMING SYSTEMS

A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
2. Protective Coating: ASTM A 653/A 653M, G40, hot-dip galvanized unless otherwise indicated.
3. Protective Coating where used at exterior walls and areas subject to high humidity, i.e., ‘wet areas’: ASTM A 653/A 653M, G90, hot-dip galvanized unless otherwise indicated.

B. Products: Subject to compliance with requirements, provide one of the following:

1. ClarkDietrich; ProSTUD Drywall Framing or Trakloc Deflection Stud Assembly.
2. MarinoWARE; QuickFrame Rough Opening System, StudRite Drywall Framing, or ViperStud Drywall Framing.
3. Telling Industries; Equivalent products.
4. Or approved equal.

C. Studs and Tracks: ASTM C 645.

1. Steel Studs and Tracks, to suit project application:

a. Minimum Base-Metal Thickness: As indicated and required by performance requirements for horizontal deflection.
b. Depth: As indicated on Drawings.

D. Slip-Type Head Joints: Where indicated, provide one of the following:

1. Single Long-Leg Track System: ASTM C 645 top track with 2-inch-deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top track and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.
2. Double-Track System: ASTM C 645 top outer tracks, inside track with 2-inch-deep flanges in thickness not less than indicated for studs and fastened to studs, and outer track sized to friction-fit over inner track.
3. Deflection Track: Steel sheet top track manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

a. Products: Subject to compliance with requirements, provide one of the following:

1) ClarkDietrich; MaxTrak or Slotted Deflection Track.
2) Telling Industries; Vertical Slip Track or Vertical Slip Track II.
3) The Steel Network, Inc.; VertiClip SLD or VertiTrack VTD.
4) Or approved equal.

E. Firestop Tracks: Top track manufactured to allow partition heads to expand and contract with movement of structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

1. Products: Subject to compliance with requirements, provide one of the following:

a. CEMCO; California Expanded Metal Products Co.; FAS Track.
b. ClarkDietrich; BlazeFrame.
c. Fire Trak Corp; Fire Trak System attached to studs with Fire Trak Posi Klip.
d. Or approved equal.

F. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.

1. Minimum Base-Metal Thickness: 0.0179 inch.

G. Cold-Rolled Channel Bridging: Steel, 0.0538-inch minimum base-metal thickness, with minimum 1/2-inch-wide flanges.

1. Depth: 1-1/2 inches.
2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch-thick, galvanized steel.

H. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
1. Minimum Base-Metal Thickness: 0.0179 inch.

2. Depth: 7/8 inch.

I. Resilient Furring Channels: 1/2-inch-deep, steel sheet members designed to reduce sound transmission.

1. Configuration: Asymmetrical or hat shaped.

J. Cold-Rolled Furring Channels: 0.053-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges.

1. Depth: 3/4 inch.
2. Furring Brackets: Adjustable, corrugated-edge-type steel sheet with minimum uncoated-steel thickness of 0.0329 inch.
3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch-diameter wire.

K. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum uncoated-metal thickness of 0.0179 inch, and depth required to fit insulation thickness indicated.

2.3 SUSPENSION SYSTEMS

A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch-diameter wire.

B. Hanger Attachments to Concrete:

1. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to New York City Department of Buildings, based on ICC-ES AC58 or AC308 as appropriate for the substrate.

a. Uses: Securing hangers to structure.
b. Type: Torque-controlled, , adhesive anchor or adhesive anchor.
c. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
d. Material for Exterior or Interior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

C. Flat Hangers: Steel sheet, 1 by 3/16 inch by length indicated.

D. Carrying Channels (Main Runners): Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0538 inch and minimum 1/2-inch-wide flanges.

1. Depth: As indicated on Drawings.

E. Furring Channels (Furring Members):

1. Cold-Rolled Channels: 0.0538-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges, 3/4 inch deep.
2. Steel Studs and Tracks: ASTM C 645.

    a. Minimum Base-Metal Thickness: As indicated on Drawings.
    b. Depth: As indicated on Drawings.

3. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep.

    a. Minimum Base-Metal Thickness: As indicated on Drawings.

4. Resilient Furring Channels: 1/2-inch-deep members designed to reduce sound transmission.

    a. Configuration: Asymmetrical or hat shaped.

F. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.

1. Products: Subject to compliance with requirements, provide one of the following systems to suit project application:

    a. Armstrong World Industries, Inc; Drywall Grid Systems.
    b. Rockfon (Rockwool International); 640/660 Drywall Ceiling Suspension, 650/670 Fire Rated Drywall Ceiling Suspension, Radius Drywall Ceiling Suspension or.
    c. USG Corporation; Drywall Suspension System or Wall-to-Wall Drywall Suspension System.
    d. Approved equal.

2.4 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

B. Isolation Strip at Exterior Walls: Provide one of the following:

1. Asphalt-Saturated Organic Felt: ASTM D 226/D 226M, Type I (No. 15 asphalt felt), nonperforated.
2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8-inch-thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Coordination with Sprayed Fire-Resistive Materials:

1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling tracks to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches o.c.
2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce thickness of fire-resistive materials below that are required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

3.4 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.

C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

D. Install bracing at terminations in assemblies.

E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.5 INSTALLING FRAMED ASSEMBLIES

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

C. Install studs so flanges within framing system point in same direction.

D. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.

    a. Install two studs at each jamb unless otherwise indicated.
    b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
    c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.

3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.

    a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.

5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
6. Curved Partitions:

    a. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.
    b. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of no fewer than two studs at ends of arcs, place studs 6 inches o.c.

E. Direct Furring: Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

F. Z-Shaped Furring Members:

1. Erect insulation, specified in Section 07 21 00 "Thermal Insulation," vertically and hold in place with Z-shaped furring members spaced 24 inches o.c
2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.

G. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.6 INSTALLING CEILING SUSPENSION SYSTEMS

A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
1. Hangers: 48 inches o.c. unless otherwise indicated.
2. Carrying Channels (Main Runners): 48 inches o.c. unless otherwise indicated.
3. Furring Channels (Furring Members): 16 inches o.c. unless otherwise indicated.

B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

C. Suspend hangers from building structure as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.

a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.

a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.

3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for

structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.

5. Do not attach hangers to steel roof deck.
6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
8. Do not connect or suspend steel framing from ducts, pipes, or conduit.

D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.

E. Seismic Bracing: Sway-brace suspension systems with hangers used for support.

F. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

G. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 09 22 16

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 09 23 00 - GYPSUM PLASTERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract."

1.2 SUMMARY

A. Work Included: The Work of this Section includes, but is not limited to the following:

1. Gypsum plaster cutting, restoring, patching and matching existing conditions as determined by Commissioner.
2. Existing plaster moldings and decorative trim will not be disturbed unless absolutely necessary to perform Contract Work.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 SUBMITTALS

A. Submittals: Submit manufacturer’s product data, Shop Drawings, coordination drawings, samples of each exposed finish, product certificates, and maintenance data.

B. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1.5 DEFINITIONS

A. Plaster is considered defective if it is cracked, crumbling, crystallized or chalking, rust stained or if any layer is separated from its substrate.

1.6 SUBMITTALS

A. Product Data: Submit manufacturer's product data for plaster materials, lath, metal supports and accessories.

B. Material Certificates: Submit producer's certificate for each kind of plaster aggregate to show that materials comply with requirements.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Installer Qualifications: Engage an Installer who has successfully completed within the last 3 years of lath and plaster projects similar to this Project.

C. Coordination of Work: Coordinate layout and installation of suspension system for suspended ceilings with work of other trades supported by, or penetrating through, ceilings and soffits prior to installation.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original containers with identification of product and manufacturer.

B. Store materials inside, under cover and keep them dry, protected from weather, contamination, aging, corrosion, and damage. Protect metal corner beads and trim from being bent or damaged.

1.9 PROJECT CONDITIONS

A. Environmental Requirements, General: Comply with requirements of plaster application standards and recommendations of plaster manufacturer for environmental conditions before, during, and after application of plaster.

B. Maintain a uniform temperature of not less than 55 deg. F, nor more than 80 deg. F, for not less than 1 week before plaster application, during application, and until plaster is dry but for not less than one week after application.

C. Ventilation: Ventilate building spaces to remove excess moisture, immediately after plaster is applied and until it sets. Maintain adequate ventilation to control humidity (between 40 and 75% relative humidity) for one week prior, during and at least one week after plaster application.

D. Protect contiguous work from soiling, splattering and other harmful effects which might result from plastering.

PART 2 - PRODUCTS

2.1 GYPSUM PLASTER MATERIALS

A. Base Coat Plasters: ASTM C 28, types as indicated below:

1. Gypsum neat plaster.

a. High strength gypsum neat plaster with a minimum average dry compressive strength of 2,800 psi per ASTM C 472 for a mix of 100 lbs. plaster and 2 cu. ft. of sand.

B. Finish Coat Plasters: Types as indicated below:

1. Gypsum gauging plaster, ASTM C 28; for flatwork.

C. Finishing Hydrated Limes: ASTM C 206, Type S.

D. Aggregates for Base Coat Plasters: ASTM C 35, sand.

E. Bond Plaster: A plaster having special bonding properties will be used for application to concrete surfaces that have been sufficiently roughened to provide a mechanical key. The Bond Plaster will be a type of recommended by the Manufacturer. It will be mixed and applied in strict accordance with the Manufacturer's directions.

F. Special Finishing Hydrated Limes, Type S: ASTM C206.

1. Lime putty will be made from special finishing hydrated lime, machine mixed with water to form a putty and allowed to stand for at least 15 minutes before using. Approved measures will be taken to protect the putty from sun and to prevent excessive evaporation when stored.

G. Fiber: Non-staining synthetic, or vegetable, or mineral product not more than 2" long, clean and free from foreign material.

H. Sand: ASTM C35.

2.2 MISCELLANEOUS MATERIALS

A. Water: Clean, fresh, potable, and free injurious amounts of oils, acids, alkalis and organic matter injurious to the plaster or any harmful contaminants which may cause staining or efflorescence.

B. Metal Lath: Expanded metal lath will be diamond mesh lath, weighing 3.4 pounds per square yard, of galvanized steel.

1. Diamond mesh lath conforming to ASTM C-847, ASTM A 525 (galv. coating for galv. lath), cut from copper bearing sheet steel, flat, expanded metal not lighter than 3.4 lbs per sq. yd. All lath will be self-furring type and paper-backed (paper to conform to FS UU-B-790A, type 1, grade D, style 2).

C. Metal Accessories: Grounds and casing corner beads will be zinc-coated sheet steel, 26 ga. or heavier, with expanded or perforated flanges or clips so shaped and fabricated as to permit compete embedment in the plaster.

D. Grounds and casing corner beads: conforming to ASTM C-1047, will be zinc-coated sheet steel, 26 ga. or heavier, with expanded or perforated flanges or clips so shaped and fabricated as to permit complete embedment in the plaster.

E. Hangers and Furring: 20 ga. Steel, 3/4", 1-1/2", or 2" cold rolled steel channel, conforming to ASTM C-841.

2.3 MIXING OF PLASTER

A. Mix and apply plaster in accordance with the directions of the Manufacturer.

B. Texture and color of finishing coat will be as approved by the Commissioner.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

B. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

3.4 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

3.5 CUTTING, PATCHING AND RESTORATION OF PLASTER

A. Cut, patch, point-up, repair and/or restore new or existing plaster as necessary to accommodate other work and to repair defects, and where bond to the substrate has failed. Use initial patches as mock-ups, when approved, for subsequent work.

B. Defective Plaster: Carefully remove soft, deteriorated, weak, unbounded, effloresced, broken, loose, re-crystallized, and otherwise damaged existing plaster back to masonry or lath and to solid adjacent plaster. The edges will be rectilinear, clean, sharp, and beveled inward to permit keying restoration into existing materials.

1. Remove plaster by layers until a sound, well-adhered layer is encountered. Unsound or poorly adhered base coats will be removed in step fashion so that each new coat in the path will lap over the underlying existing plaster coat.
2. Cracks: Enlarge cracks that are 1/16 inch wide or wider. Cut back to solid substrate using carborundum-tipped saw blade. Cut perpendicular to surface and straight. Do not further enlarge cracks except to remove soft, broken, or loose materials or to restore backup materials. Where approved, widen cracks and install strip lath over substrate centered at location of cracking before making patching plaster.
3. Do not attempt to restore cracks until the underlying cause of the cracks has been identified and eliminated.
4. Do not attempt to restore more cracks than can be finished before the patching plaster has had a chance to set up.

C. Patching: Clean, prepare surface and moisten existing plaster to be patched, apply bonding agent and plaster to comply with referenced standards and manufacturer's recommendations. Finish coat patching over stable base coats will be acceptable.

1. Bonding Agents: Apply to every surface that will receive plaster. Apply complete bond coat over existing and new plaster base coat prior to application of finish coat. Surfaces to which bonding agent is to be applied will be clean and free from substances that will affect bond. Follow bonding agent manufacturer's recommendations in every instance. Permit bonding agent to dry properly before applying plaster. Do not exceed manufacturer's recommendations for application of plaster to bonding agent. Do not apply plaster to bonding agents contaminated with dust. Coordinate drying and curing time of plaster with application of bonding agents to prevent excessive drying of bonding agent.
2. Cleaning and Dampening Substrates: Sweep masonry and lath clean immediately before plaster is applied, and a bonding agent is applied. Dampen surfaces of existing plaster, unless the bonding agent manufacturer recommends otherwise.
3. Thickness and Number of Coats: At patches and extensions in existing work, match thickness of existing plaster, and make finish of patch or extension flush with existing plaster. New plaster patches or extensions, including all coats will match adjacent, existing plaster thickness.
4. Each coat will be allowed to cure and dry thoroughly before the succeeding coat is applied. Full-thickness patches will be built-up in layers, the same as new work. Extensions and full-thickness patches will be made using three-coat plaster applications. Two-coat plaster applications will be limited to those recommended by the plaster manufacturer and permitted by applicable ASTM standards.

5. Apply final coat of plaster to match and blend with existing plaster, where applicable.
6. After finishing plaster patches, remove plaster residue from the plaster surface using clear water. When the water has dried, wipe the area with clean dry rags to remove plaster dust completely.

D. Finish: Sand smooth-troweled finishes to remove trowel marks and arises. Restoration and extensions will match existing finishes and be blended so that patches and extensions are indiscernible.

E. Finish Levels: Finish areas of patching to match existing conditions and equivalent to:

1. Level 4 gypsum board finish. Finish Standard throughout entire project at surfaces that will be exposed to view, unless otherwise indicated.

a. Primer and its application to surfaces are specified in other Division 09 Sections.

F. Replace plaster materials that are tested by other to contain excessive alkalis.

G. All surfaces are to be inspected by the painting subcontractor with the plaster subcontractor. Perform all required remedial work, to provide acceptable surfaces, ready for painting.

3.6 INSTALLATION OF ACCESSORIES

A. Existing Plaster Accessories: Remove where damaged and where necessary to carry out the work.

1. Install new plaster accessories where existing accessories have been removed. Anchor securely to substrates. Match lines of existing accessories where the total plaster thickness increases because new plaster is placed over existing plaster, it will be necessary to remove the existing accessories and provide new accessories properly sized for the new conditions.
2. Cracks will be widened to about 6 inches. The plaster will be removed down to the lath or solid substrate. Strip lath will be placed over substrate, centered at the location of the crack and securely fastened in place before the plaster is patched.

3.7 CLEANING AND PROTECTION

A. Remove temporary protection and enclosure of work by other trades. Promptly remove plaster from surfaces which are not to be plastered. Repair floors, walls and other surfaces which have been stained, or damaged by plastering work. When plastering work is completed, remove unused materials, containers and equipment and clean floors of plaster debris.

B. Provide final protection and maintain conditions, in a manner suitable to Installer, which ensures plaster work being without damage or deterioration at time of Substantial Completion.

END OF SECTION 09 23 00

SECTION 09 29 00 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Interior gypsum board.
2. Tile backing panels.
3. Installation accessories.

B. Related Sections:

1. Section 09 21 16 "Gypsum Board Shaft Wall Assemblies."
2. Section 09 22 16 "Non- structural Metal Framing."
3. Section 09 30 00 "Tiling."

1.3 COORDINATION

A. Coordinate installation of gypsum board products and metal framing with other trades.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Environmental Product Declaration (EPD): For each product.
2. Product Data: For adhesives and sealants, indicating VOC content.
3. Laboratory Test Reports: For adhesives and sealants, indicating compliance with requirements for low-emitting materials.
4. Laboratory Test Reports: For ceiling and wall materials, indicating compliance with requirements for low-emitting materials.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

1.7 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

C. VOC Requirements: Refer to DDC General Conditions Section 01 81 13.04 Sustainable Design Requirements for LEED v4 Buildings.

D. Ceiling and wall materials must comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Georgia-Pacific Gypsum LLC.
2. National Gypsum Company
3. USG Corporation.
4. Or approved equal.

2.3 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and

that correspond with support system indicated.

2.4 INTERIOR GYPSUM BOARD

A. Gypsum Board, Type X: ASTM C1396/C1396M.

1. Long Edges: Tapered and featured (rounded or beveled) for prefilling.

B. Gypsum Board, Type C: ASTM C1396/C1396M. Manufactured to have increased fire-resistive capability.

1. Thickness: ½ inch in assembly thickness required by fire-resistance-rated assembly indicated on Drawings.
2. Long Edges: Tapered.

C. Gypsum Ceiling Board: ASTM C1396/C1396M.

1. Thickness: 5/ 8 inch.
2. Long Edges: Tapered.

D. Mold-Resistant Gypsum Board: ASTM C1396/C1396M. With moisture- and mold-resistant core and paper surfaces.

1. Core: 5/ 8-inch, Type X.
2. Long Edges: Tapered.
3. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

2.5 TILE BACKING PANELS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. CertainTeed Corporation; FiberCement BackerBoard.
2. National Gypsum Company; PermaBase BRAND Cement Board.
3. USG Corporation; DUROCK Cement Board or USG Durock Brand Cement Board.
4. Or approved equal.

B. Core: ½ inch, Type X.

C. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

2.6 TRIM ACCESSORIES

A. Interior Trim: ASTM C1047.

1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
2. Shapes, Use the following as indicated and required to suit project application:

a. Cornerbead.

b. Bullnose bead.
c. LC-Bead: J-shaped; exposed long flange receives joint compound.
d. L-Bead: L-shaped; exposed long flange receives joint compound.
e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
f. Expansion (control) joint.
g. Curved-Edge Cornerbead: With notched or flexible flanges.

2.7 DECORATIVE PROFILE TRIM AND REVEALS

A. Description: Extruded aluminum profile trim and reveal, in sizes and configurations; drywall reveal, "F"-reveal, "Z"-reveal, as indicated on drawings.

B. Finish: Extruded aluminum, clear anodized finish.

C. Basis-of-Design Product: Subject to compliance with requirements, provide DRM/ DRMF series as manufactured by Fry Reglet, or a comparable product by one of the following:

1. 200/300/400/500 Series Reveals - Gordon.
2. STR/SWR/SWR-U Series - Pittcon Industries,
3. Or approved equal.

2.8 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C475/C475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
3. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.

   a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.
5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.

D. Joint Compound for Tile Backing Panels:

1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.

2. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.9 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

C. Steel Drill Screws: ASTM C1002 unless otherwise indicated.

D. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 APPLYING AND FINISHING PANELS

A. Comply with ASTM C840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered

edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

J. Attachment for Decorative Profile Trim and Reveals: Screw to gypsum board panels through 7/8 inch grooved mudding ramps at each side.

1. Apply tape and joint compound over mudding ramps flush with adjacent finish.
2. Use projecting or flush trim edges at reveal, as indicated on drawings.

K. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

L. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

M. Prefill open joints, rounded or beveled edges, and damaged surface areas.

N. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

O. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.

2. Level 2: Panels that are substrate for tile.
3. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
4. Level 5: Where indicated on Drawings.

P. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

3.4 PROTECTION

A. Protect adjacent surfaces from joint compound and promptly remove from floors and other non-drywall surfaces. Restore surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and restore panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

D. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 29 00

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 09 30 00 – TILING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract."

1.2 SUMMARY

A. Section Includes:

1. Ceramic tile.

1.3 DEFINITIONS

A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.

B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in its "Specifications for Installation of Ceramic Tile."

C. Module Size: Actual tile size plus joint width indicated.

D. Face Size: Actual tile size, excluding spacer lugs.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Product Data: For adhesives, indicating VOC content.
2. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.
3. Laboratory Test Reports: For sealers, indicating compliance with requirements for low-emitting materials.

C. Samples for Initial Selection: For tile, grout, and accessories involving color selection.

D. Samples for Verification:

1. Full-size units of each type and composition of tile and for each color and finish required.
2. Assembled samples mounted on a rigid panel, with grouted joints, for each type and composition of tile and for each color and finish required. Make samples at least 12 inches square, but not fewer than four tiles. Use grout of type and in color or colors approved for completed Work.
3. Full-size units of each type of trim and accessory for each color and finish required.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.

C. Product Certificates: For each type of product.

D. Product Test Reports: For tile-setting and -grouting products and certified ceramic tile.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockup of each type of wall tile installation.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.

B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.

D. Store liquid materials in unopened containers and protected from freezing.

1.10 FIELD CONDITIONS

A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Tile: Obtain tile of each type and color or finish from single source or producer.

1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.

B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.

1. Obtain setting and grouting materials, except for unmodified Portland cement and aggregate, from single manufacturer.
2. Obtain waterproof membrane from manufacturer of setting and grouting materials.

2.2 PRODUCTS, GENERAL

A. ANSI Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

1. Provide tile complying with Standard grade requirements.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

D. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.

1. Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.

2.3 TILE PRODUCTS

A. Ceramic Tile Type (T-1 and T-2): Glazed.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Nemo.
b. Daltile.
c. Porcelenosa.
d. Or approved equal.

2. Certification: Tile certified by the Ceramic Tile Certification Agency.
3. Face Size: As indicated on the Drawings.
4. Face Size Variation: Rectified.
5. Thickness: 3/8 inch.
6. Face: As indicated.
7. Dynamic Coefficient of Friction: Not less than 0.42.
8. Tile Color, Glaze, and Pattern: As indicated by manufacturer’s designations.
9. Grout Color: Match Commissioner's sample.
10. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile where indicated. Provide shapes as follows, selected from manufacturer's standard shapes:

a. Wainscot Cap: Jolly, 1/2 x 11-15/16 inch same as adjoining flat tile unless otherwise indicated.
b. Wainscot Cap for Flush Conditions: Regular flat tile for conditions where tile wainscot is shown flush with wall surface above it, same size as adjoining flat tile.
c. External Corners: Surface bullnose, module size same as adjoining flat tile.
d. Internal Corners: Field-butted square corners.

B. General: Refer to Finish Schedule on Drawings for tile products.

2.4 SETTING MATERIALS

A. Improved Modified Dry-Set Mortar (Thinset): ANSI A118.15.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Custom Building Products.
b. LATICRETE SUPERCAP, LLC.
c. MAPEI Corporation.
d. Or approved equal.

2.5 GROUT MATERIALS

A. Water-Cleanable Epoxy Grout: ANSI A118.3, with a VOC content of 65 g/L or less.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Custom Building Products.
b. LATICRETE SUPERCAP, LLC.
c. MAPEI Corporation.
d. Or approved equal.

2.6 MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

B. Transition Strips: Type and style as shown on the Finish Schedule on the Drawings.

C. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

2.7 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
2. Verify that concrete substrates for tile floors installed with thinset mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.

    a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
    b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.

3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Commissioner.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.

C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.4 TILE INSTALLATION

A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

E. Where accent tile differs in thickness from field tile, vary setting-bed thickness so that tiles are flush, unless otherwise indicated.

F. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

1. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
2. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.

G. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:

1. Ceramic Tile: as per manufacturers recommendation.

H. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.

3.5 ADJUSTING AND CLEANING

A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.

B. Cleaning: On completion of placement and grouting, clean all tile surfaces so they are free of foreign matter.

1. Remove grout residue from tile as soon as possible.
2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

3.6 PROTECTION

A. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.

B. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.7 TILE INSTALLATION SCHEDULE

A. Wall Installations, Metal Studs:

1. TCNA W244C or TCNA W244F: Thinset mortar on cementitious backer units or fiber-cement backer board.

a. Ceramic Tile Type: Ceramic tile.
b. Thinset Mortar: Improved modified dry-set mortar.
c. Grout: Standard unsanded cement grout.

END OF SECTION 09 30 00

SECTION 09 51 13 – ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section includes:

1. Acoustical ceiling panels.
2. Exposed suspension systems for interior ceilings.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Laboratory Test Reports: For ceiling products, indicating compliance with requirements for low-emitting materials.

C. Samples: For each exposed product and for each color and texture specified.

1.5 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For each acoustical panel ceiling suspension system and anchor and fastener type, from ICC-ES.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1. Build mockup of typical ceiling area as shown on Drawings.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Commissioner specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain each type of acoustical ceiling panel and its supporting suspension system from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Class A according to ASTM E 1264.
2. Smoke-Developed Index: 50 or less.

2.3 ACOUSTICAL PANELS, GENERAL

A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectance, unless otherwise indicated.

1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4-inches away from test surface per ASTM E 795.

B. Ceiling Panel Colors and Patterns: Match appearance characteristics indicated for each product type.

1. Where appearance characteristics of panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by the Commissioner from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

C. Coating-Based Antimicrobial Treatment: Provide panels with face and back surfaces coated with antimicrobial treatment consisting of manufacturer's standard formulation with fungicide added to inhibit growth of mold and mildew and showing no mold or mildew growth when tested according to ASTM D 3273.

2.4 ACOUSTICAL PANELS

A. Basis of Design Product: Subject to compliance with requirements, provide Optima Square Tegular 3520 by Armstrong World Industries, or comparable product by one of the following:

1. USG Interiors Inc.
2. Hunter Douglas Architectural Products.
3. Or approved equal.

B. Additional Product Requirements:

1. Size: 24 in by 24 in by 1 inch.
2. Light Reflectance: 0.88.

2.5 METAL SUSPENSION SYSTEMS

A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.

B. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.

C. Exposed Steel Suspension System: Main and cross-runners, roll formed from or electrolytic zinc-coated cold rolled steel sheet, with 1-1/2" high by 15/16" wide exposed faces, and slotted reveal where indicated, metal flanges; other characteristics as follows:

1. Structural Classification: Intermediate-Duty System.
2. Cap Material and Finish: Steel sheet painted to match color indicated by reference to manufacturer's standard color designations.

D. Basis of Design Product: Subject to compliance with requirements, provide Suprafine XL Series as manufactured by Armstrong World Industries or comparable product by one of the following:

1. USG Interiors Inc.
2. Hunter Douglas Architectural Products.
3. Or approved equal.

2.6 METAL EDGE MOLDINGS AND TRIM

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Armstrong World Industries, Inc.
2. Fry Reglet Corporation.
3. USG Interiors, Inc.
4. Or approved equal.

B. Roll-Formed Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit acoustical panel edge details and suspension systems indicated; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners.

2.7 ACCESSORIES

A. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "In-Direct Hung," unless otherwise indicated.

B. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

C. Angle Hangers: Angles with legs not less than 7/8-inch-wide; formed with 0.04-inch- thick, galvanized steel sheet complying with ASTM A 653/A 653M, G90 coating designation; with bolted connections and 5/16-inch- diameter bolts.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated and comply with layout shown on reflected ceiling plans.

B. Layout openings for penetrations centered on the penetrating items.

3.4 INSTALLATION

A. General: Install acoustical panel ceilings to comply with ASTM C 636, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
3. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
4. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to post installed mechanical or adhesive anchors that extend into concrete.
5. Do not attach hangers to steel deck tabs.
6. Do not attach hangers to steel roof deck. Attach hangers to structural members.
7. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
8. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

C. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed o.c. and not more than 3 inches from ends. Miter corners accurately and connect securely.
2. Do not use exposed fasteners, including pop rivets, on moldings and trim.

D. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

E. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.

1. Arrange directionally patterned acoustical panels as follows:

a. Install all ceiling systems in accordance with reflected ceiling plan.
b. Ceiling systems will align with the segment of the curve they exist within, cut on angles as required to comply with building geometry.

3.5 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.

B. Remove and replace ceiling components that cannot be successfully cleaned and restored to permanently eliminate evidence of damage.

END OF SECTION 09 51 13

SECTION 09 54 23 - LINEAR METAL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Strip, linear metal pans and suspension systems for ceilings.

1.3 COORDINATION

A. Coordinate layout and installation of linear metal pans and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Product Data: For adhesives, indicating VOC content.
2. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.

C. Samples for Initial Selection: For components with factory-applied color and other decorative finishes.

D. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below:

1. Linear Metal Pan: Set of 12-inch-long Samples of each type and color and a 12-inch-long spliced section.
2. Suspension System Members: 12-inch-long Sample of each type.
3. Exposed Molding and Trim: Set of 12-inch-long Samples of each type, finish, and color.
4. Filler Strips: Set of 12-inch-long Samples of each type, finish, and color.
5. Sound Absorber: 12 inches long.
6. End Cap: Full size.

E. Submittal: For design of attachment devices.

1.7 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Linear pattern.
2. Joint pattern.
3. Ceiling suspension members.
4. Method of attaching hangers to building structure.

   a. Furnish layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.

5. Ceiling-mounted items including light fixtures, diffusers, grilles, speakers, sprinklers, and access panels.
6. Ceiling perimeter and penetrations through ceiling; trim and moldings.
7. Minimum Drawing Scale: 1/4 inch = 1 foot.

B. Product Test Reports: For each linear metal ceiling, for tests performed by a qualified testing agency.

C. Evaluation Reports: For linear metal ceiling and components and anchor and fastener type.

D. Field quality-control reports.

1.8 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.9 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Testing Agency Qualifications: Accredited by National Voluntary Laboratory Accreditation Program for testing indicated.

C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for materials and execution.

1. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver linear metal pans, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they are protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Handle linear metal pans, suspension system components, and accessories carefully to avoid damaging units and finishes in any way.

1.11 PROJECT CONDITIONS

A. Environmental Limitations: Do not install linear metal ceilings until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Engineering Services: Engage a engineer licensed in the State of New York, as defined in Section 014000 "Quality Requirements" to design attachment devices.

B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
2. Smoke-Developed Index: 50 or less.

2.2 LINEAR METAL CEILING PANS

A. Basis of Design Product: Subject to compliance with requirements, provide “LCB 738 Smooth” as manufactured by Atas, or comparable product by one of the following:

1. Armstrong.
2. Hunter Douglas.
3. Or approved equal.

B. Sheet Metal Characteristics: For metal components exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, roughness, stains, or discolorations.

1. Aluminum Sheet: Roll-formed aluminum sheet in.032 thickness, complying with ASTM B 209; alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

    a. Metal Finish: Smooth.
    b. Painted Finishes: Electrolytic zinc-coated steel complying with ASTM A 879/A 879M, 04Z coating; surface treatment as recommended by finish manufacturer for type of use and finish indicated.

C. Pan Fabrication: Manufacturer's standard units of size, profile, and edge treatment indicated, formed from metal indicated to snap on and be securely retained on carriers without separate fasteners, and finished to comply with requirements indicated.

D. Pan Splices: Construction same as pans, in lengths 8 to 12 inches; with manufacturer's standard finish.

E. End Caps: Metal matching pans; fabricated to fit and conceal exposed ends of pans.

F. Flush Filler Strips: Metal matching pans; fabricated to uninterruptedly close voids between pans.

    1. Color: As selected by the Commissioner from manufacturer’s full range.

G. Moldings and Trim: Provide manufacturer's standard moldings and trim for exposed members, and as indicated or required, for edges and penetrations of ceiling, around fixtures, at changes in ceiling height, and for other conditions; of same metal and finish as linear metal ceiling pans.

2.3 METAL SUSPENSION SYSTEMS

A. Metal Suspension Systems Standard: Provide ceiling manufacturer's standard metal suspension systems of types and finishes indicated that comply with applicable ASTM C 635/C 635M requirements.

B. Suspension Systems: Provide systems complete with carriers with cloud trim edging, splice sections, connector clips, alignment clips, leveling clips, hangers, molding, trim, retention clips, load-resisting struts, fixture adapters, and other suspension components required to support ceiling units and other ceiling-supported construction.

C. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, Direct Hung, unless otherwise indicated.

D. Wire Braces and Ties: Provide wire complying with the following requirements:

    1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
    2. Size: Select wire diameter so its stress at 3 times the hanger design load indicated in ASTM C 635/C 635M, Table 1, Direct Hung is less than yield stress of wire, but provide not less than 0.106-inch-diameter wire.

E. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed from 0.04-inch-thick, galvanized-steel sheet complying with ASTM A 653/A 653M, G90 coating designation; with bolted connections and 5/16-inch-diameter bolts.

F. Carriers: Factory finished.

1. Main Carriers: Steel, not less than 0.0209-inch nominal thickness, cold-rolled sheet, with factory-applied protective coating, complying with ASTM C 635/C 635M.

a. Hot-Dip Galvanized Steel: ASTM A 653/A 653M, not less than G60 zinc coating.

G. Carrier Splices: Same metal, profile, and finish as for carriers.

H. Stabilizer Channels, Tees, and Bars: Manufacturer's standard components for stabilizing main carriers at regular intervals and at light fixtures, air-distribution equipment, access doors, and other equipment; spaced as standard with manufacturer for use indicated; and factory finished with matte-black baked finish.

I. Hold-Down Clips: Manufacturer's standard hold-down clips spaced as standard with manufacturer.

J. Edge Moldings and Trim: Provide exposed members as indicated or required to comply with seismic requirements of 2014 New York City Building Code, to conceal edges of penetrations through ceiling, to conceal ends of pans and carriers, for fixture trim and adapters, for fasciae at changes in ceiling height, and for other conditions; of metal and finish matching linear metal pans or extruded plastic unless otherwise indicated.

1. For Circular Penetrations of Ceiling: Fabricate edge moldings to diameter required to fit penetration exactly.

2.4 ALUMINUM PANS AND SUSPENSION SYSTEM FOR LINEAR METAL CEILING

A. Aluminum Pans and Suspension System:

1. Basis-of-Design Product: Subject to compliance with requirements, provide aluminum pan suspension system as manufactured by Atas, or comparable product by one of the following:

a. Armstrong.
b. Hunter Douglas.
c. Or approved equal.

B. Classification: Units complying with ASTM E 1264 for Type XIII, aluminum strips with mineral- or glass-fiber-base backing; Form 1, perforated.

1. Pattern: As indicated in Finish Schedule on Drawings.

C. Pan Thickness: As recommended by manufacturer.

D. Pan Edge Detail: Manufacturer's standard edge detail.

E. Linear Module Width and Pan Face Width: As indicated on Drawings.

F. Pan Depth: As indicated.

G. Pan Face Finish: To match Commissioner's samples.

H. End Cap, Finish of Exposed Portions: To match pan.

I. Filler Strip Design: Flush, unless otherwise indicated.

J. Filler Strip, Finish of Exposed Portions: To match pan.

K. Suspension-System Main-Carrier Material: Aluminum.

2.5 ACCESSORIES

A. Access Panels: For access at locations indicated, provide door hinge assembly, retainer clip, and retainer bar, assembled with ceiling panels and carrier sections into access doors of required size, permitting upward or downward opening.

2.6 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 ALUMINUM FINISHES

A. Color-Coated Finish: Manufacturer's standard powder-coat baked paint finish complying with coating manufacturer's written instructions for surface preparation, pretreatment, application, baking, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing and substrates to which linear metal ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of linear metal ceilings.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Measure each ceiling area and establish layout of linear metal pans to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width pans at borders and comply with layout shown on reflected ceiling plans and on Coordination Drawings.

3.4 INSTALLATION

A. Comply with ASTM C 636/C 636M and seismic requirement indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
4. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both structure to which hangers are attached and type of hanger involved. Install hangers in a manner that does not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
5. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
6. Do not attach hangers to steel roof deck. Attach hangers to structural members.
7. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
8. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers but

without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Install edge moldings and trim of type indicated at perimeter of linear metal ceiling area and where necessary to conceal edges and ends of linear metal pans.

1. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
2. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension system carriers so they are aligned and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Cut linear metal pans for accurate fit at borders and at interruptions and penetrations by other work through ceilings. Stiffen edges of cut units as required to eliminate evidence of buckling or variations in flatness exceeding referenced standards for stretcher-leveled metal sheet.

G. Install linear metal pans in coordination with suspension system and exposed moldings and trim.

1. Align joints in adjacent courses to form uniform, straight joints parallel to room axis in both directions unless otherwise indicated.
2. Fit adjoining units to form flush, tight joints. Scribe and cut units for accurate fit at borders and around construction penetrating ceiling.
3. Install pans with butt joints using internal pan splices and with joint configuration as indicated.
4. Install directionally textured metal pans in directions indicated.
5. Where metal pan ends are visible, install end caps unless trim is indicated.
6. Install filler strips where indicated.
7. Install sound-absorbent pads at right angle to perforated metal pans so pads do not hang unsupported.

H. Install hold-down clips where indicated.

3.5 CLEANING

A. Clean exposed surfaces of linear metal ceilings, including trim and edge moldings after removing strippable, temporary protective covering if any. Comply with manufacturer's written instructions for stripping of temporary protective covering, cleaning, and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage, including dented and bent units.

END OF SECTION 09 54 23

SECTION 09 65 00 – RESILIENT FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Luxury vinyl tile.
2. Vinyl Tile.
3. Rubber flooring.
4. Rubber stair accessories.
5. Installation accessories.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Laboratory Test Reports: For floor covering products, adhesives, and sealants indicating compliance with requirements for low-emitting materials.
2. Product Data: For adhesives and sealants, indicating VOC content.
3. Environmental Product Declaration: For each product.
4. Health Product Declaration: For each product.
5. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.

C. Samples: For each exposed product and for each color and texture specified.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storing.

B. Store materials to prevent deterioration and in accordance with material manufacturers' requirements.

1. Store tiles on flat surfaces.

1.7 FIELD CONDITIONS

A. Adhesively Applied Products:

1. Maintain temperatures during installation within range recommended in writing by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive flooring 48 hours before installation, during installation, and 48 hours after installation unless longer period is recommended in writing by manufacturer.
2. After post installation period, maintain temperatures within the range recommended in writing by manufacturer, but not less than 55 deg F or more than 95 deg F.
3. Close spaces to traffic during flooring installation.
4. Close spaces to traffic for 48 hours after flooring installation unless manufacturer recommends longer period in writing.

B. Install flooring after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 LUXURY VINYL FLOOR TILE (LVT-1)

A. Basis of Design Product: Subject to compliance with requirements, provide Lucinda GlueCore Mosaic as manufactured by Lucinda or comparable product by one of the following.

1. Armstrong World Industries, Inc.
2. Interface.
3. Or approved equal.

B. Tile Standard: ASTM F2199.

C. Wearing Surface: Smooth, 28mil.

D. Thickness: 0.12 inch.

E. Size: 8-13/16 x 10-3/8 inches.

F. Colors and Patterns: As scheduled.

2.2 LUXURY VINYL FLOOR TILE (LVT-2)

A. Basis of Design Product: Subject to compliance with requirements, provide Scorpio as manufactured by Interface or comparable product by one of the following.

1. Armstrong World Industries, Inc.
2. Shaw Contract.
3. Or approved equal.

B. Tile Standard: ASTM F1066, Class 3, surface pattern.

C. Wearing Surface: Smooth.

D. Thickness: 0.125 inch.

E. Size: 24.9 x 28.8 inches.

F. Colors and Patterns: As scheduled.

2.3 VINYL COMPOSITION FLOOR TILE (VCT-1)

A. Basis of Design Product: Subject to compliance with requirements, provide Premium Excelon as manufactured by Armstrong World Industries, Inc., or comparable product by one of the following:

1. Lucinda, USA.
2. Tarkett.
3. Or approved equal.

B. Tile Standard: ASTM F1066, Class 1 solid tile, ISO 10595- Type l.

C. Wearing Surface: Smooth.

D. Thickness: 0.125 inch.

E. Size: 12 x 12 inches.

F. Colors and Patterns: As scheduled.

2.4 RUBBER FLOOR TILE (SH-1)

A. Basis of Design Product: Subject to compliance with requirements, provide Milled Rubber Tile, 67N Dark Ash as manufactured by Procedo, or comparable product by one of the following:

1. Interface.
2. Roppe Corporation.
3. Or approved equal.

B. Tile Standard: ASTM F1344, Class I-A & B, Homogeneous Rubber Tile, solid color.

C. Hardness: Grade 1, minimum hardness of 85, measured using Shore, Type A durometer according to ASTM D2240.

D. Wearing Surface: Hammered.

E. Thickness: 0.125 inch.

F. Size: 18 by 18 inches.

2.5 RUBBER STAIR TREADS (SH-2)

A. Basis of Design Product: Subject to compliance with requirements, provide #99 rubber stair treads as manufactured by Roppe, or comparable product by one of the following:

1. Flexco.
2. Allstate.
3. Or approved equal.

B. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

C. Stair Treads: ASTM F2169.

1. Type: TS (rubber, vulcanized thermoset).
2. Class: 2 hammered pattern.
3. Group: 1 (embedded abrasive strips) 2 (with contrasting color for the visually impaired).
4. Nosing Style: Square, adjustable to cover angles between 60 and 90 degrees.
5. Nosing Height: 2 inches.
6. Thickness: 1/4 inch and tapered to back edge.
7. Size: Lengths and depths to fit each stair tread in one piece or, for treads exceeding maximum lengths manufactured, in equal-length units with smooth black rubber insert.

D. Landing Tile: 18 x 118 inches matching treads; produced by same manufacturer as treads and recommended by manufacturer for installation with treads.

E. Locations: Provide rubber stair accessories in areas indicated.

F. Colors and Patterns: Match Commissioner's sample.

2.6 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B. Adhesives: Type as recommended by product manufacturer for substrate conditions indicated.

1. VOC Content: Refer to DDC General Conditions Section 01 81 13.04 Sustainable Design Requirements for LEED v4 Buildings.
2. Adhesive must comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

C. Stair-Tread Nose Filler: Two-part epoxy compound recommended by resilient stair-tread manufacturer to fill nosing substrates that do not conform to tread contours.

D. Floor Polish: Provide protective, liquid floor-polish products recommended by resilient flooring and stair-tread manufacturer.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.3 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates for Resilient Stair Accessories: Prepare horizontal surfaces according to ASTM F710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.

4. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft. and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

    a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
    b. Relative Humidity Test: Using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install resilient products until materials are the same temperature as space where they are to be installed.

3.4 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

    1. Lay tiles square with room axis.

C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.

G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

H. Adhere floor tiles to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.5 RESILIENT STAIR TREAD INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient stair treads.

B. Resilient Stair Tread Installation:

1. Use stair-tread-nose filler to fill nosing substrates that do not conform to tread contours.
2. Tightly adhere to substrates throughout length of each piece.
3. For treads installed as separate, equal-length units, install to produce a flush joint between units.

3.6 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Perform the following operations immediately after completing resilient-product installation:

1. Remove adhesive and other blemishes from surfaces.
2. Sweep and vacuum horizontal surfaces thoroughly.
3. Damp-mop horizontal surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Floor Polish: Remove soil, adhesive, and blemishes from resilient flooring before applying liquid floor polish.

1. Apply number of coats recommended in writing by resilient flooring and stair tread manufacturer.

E. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 09 65 00

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 09 65 13 – RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Thermoset-rubber base.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Product Data: For adhesives, indicating VOC content.
2. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.
3. Product Data: For sealants, indicating VOC content.
4. Laboratory Test Reports: For sealants, indicating compliance with requirements for low-emitting materials.
5. Laboratory Test Reports: For resilient base and stair products and accessories, indicating compliance with requirements for low-emitting materials.
6. Environmental Product Declaration: For each product.
7. Health Product Declaration: For each product.
8. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer

C. Samples: For each exposed product and for each color and texture specified, not less than 12 inches long.

D. Samples for Initial Selection: For each type of product indicated.

E. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches long.

F. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.6 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Install resilient products after other finishing operations, including painting, have been completed.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

PART 2 - PRODUCTS

2.1 THERMOPLASTIC-RUBBER BASE (B-2) (B-3)

A. Basis-of-Design Product: Subject to compliance with requirements, provide rubber wall base with and without toe profile as manufactured by Allstate, or comparable product by one of the following:

1. Johnsonite; a Tarkett company.
2. Roppe Corporation.
3. Or approved equal.

B. Product Standard: ASTM F1861, Type TP (rubber, thermoplastic).

1. Group: I (solid, homogeneous).
2. Style and Location:

a. Style A, Straight: B-2. Color from manufacture’s standard.

b. Style B, Cove: B-3. Color from manufacture's standard.

C. Thickness: 0.125 inch.

D. Height: 6 inches.

E. Lengths: Coils in manufacturer's standard length.

F. Outside Corners: Preformed.

G. Inside Corners: Job formed.

2.2 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

1. VOC content: Refer to DDC General Conditions Section 01 81 13.04 Sustainable Design Requirements for LEED v4 Buildings for VOC Requirements.".

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.3 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

C. Do not install resilient products until materials are the same temperature as space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.4 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Preformed Corners: Install preformed corners before installing straight pieces.

H. Job-Formed Corners:

1. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.

a. Miter or cope corners to minimize open joints.

3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Perform the following operations immediately after completing resilient-product installation:

1. Remove adhesive and other blemishes from surfaces.
2. Sweep and vacuum horizontal surfaces thoroughly.
3. Damp-mop horizontal surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 09 65 13

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 09 67 23 – RESINOUS FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section includes:

1. Resinous flooring systems.
2. Waterproofing membrane, cold-applied self-curing liquid rubber polymer, installed in conjunction with broadcast epoxy installation at toilet floors.
3. Installation accessories.

1.3 COORDINATION

A. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Environmental Product Declaration: For each product.
2. Health Product Declaration: For each product.
3. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.
4. Multi-Attribute Optimization: For each product, provide documentation of third-party certification, indicating impact reduction in global warming potential, depletions of stratospheric ozone layer, acidification of land and water sources, eutrophication, and/or formation of tropospheric ozone.
5. Supply Chain Optimization: For each product, provide documentation demonstrating that manufacturer practices comply with supply chain optimization requirements.
6. Laboratory Test Reports: For finish system, indicating compliance with requirements for low emitting materials.
7. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low emitting materials.

C. Samples: For each type of exposed finish required.

1.6 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each resinous flooring component, from manufacturer.

B. Material Test Reports: For each resinous flooring system, by a qualified testing agency.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For resinous flooring to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Installer Qualifications: Installer will be properly trained by the manufacturer.

C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Apply full-thickness mockups on 96-inch-square floor area selected by Commissioner.
   a. Include 96-inch length of integral cove base with inside and outside corner.

2. Simulate finished lighting conditions for Commissioner's review of mockups.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Commissioner specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.

1.10 FIELD CONDITIONS

A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.

B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.

C. Close spaces to traffic during resinous flooring application and for 24 hours after application unless manufacturer recommends a longer period.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Flammability: Self-extinguishing according to ASTM D 635.

2.2 RESINOUS FLOORING

A. General: Resinous flooring must comply with troweled mortar base with broadcast topping. Liquid rich, slurry type systems will not be accepted.

B. Basis of Design Product: Subject to compliance with requirements, provide Stonshield HRI as manufactured by Stonhard Inc., or comparable product by one of the following:

1. Sika Corporation Flooring.
2. Tnemec Inc.
3. Or approved equal.

C. System Characteristics:

1. Color and Pattern: As selected by the Commissioner.
2. Wearing Surface: Standard.
3. Integral Cove Base: 6 inches unless otherwise indicated.
4. Overall System Thickness: nominal 3/16”.

D. System Components: Manufacturer's standard components that are compatible with each other and as follows:

1. Primer:

a. Material Basis: Standard Primer.
b. Resin: Epoxy.
c. Formulation Description: (2) two component, 100 percent solids.
d. Application Method: Squeegee and roller.
e. Number of Coats: (1) one.

2. Mortar Base:

a. Material Basis: mortar
b. Resin: Epoxy.
c. Formulation Description: (3) three component, 100 percent solids.
d. Application Method: Metal Trowel.

1) Thickness of Coats: nominal 3/16” (inch).
2) Number of Coats: One.

e. Aggregates: Pigmented Blended aggregate.

3. Undercoat:

a. Resin: Epoxy.
b. Formulation Description: (2) two-component, 100% solids, UV Stable.
c. Type: Clear.

d. Finish: Gloss.
e. Number of Coats: one.

4. Broadcast Media:

a. Material Basis: quartz aggregate.
b. Type: pigmented.
c. Finish: standard.
d. Number of Coats: one.
e. Pattern: Tweed.

5. Sealer:

a. Resin: Epoxy.
b. Formulation Description: (2) two-component, 100% solids, UV Stable.
c. Type: Clear.
d. Finish: Gloss.
e. Number of Coats: one.
f. Texture level: Standard or medium.

2.3 ACCESSORY MATERIALS

A. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.

B. Joint Sealant: Type recommended or produced by resinous flooring manufacturer for type of service and joint condition indicated. Allowances should be included for manufacturer's recommended joint fill material, and concrete crack treatment.

C. Waterproof membrane, use of manufacturer's waterproof membrane required on floors above grade, 25 mil waterproof membrane.

D. Pitch materials, use of manufacturer's recommended epoxy grout required for all areas that require positive pitch to drains.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry, and neutral Ph substrate for resinous flooring application.

B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.

1. Mechanically prepare substrates as follows:

    a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
    b. Comply with ASTM C 811 requirements unless manufacturer's written instructions are more stringent.

2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written recommendations.
3. Verify that concrete substrates are dry.

    a. Perform in situ probe test, ASTM F 2170. Proceed with application only after substrates do not exceed a maximum potential equilibrium relative humidity of 75 percent.
    b. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application only after substrates have maximum moisture-vapor-emission rate of 5 lb of water/1000 sq. ft. of slab in 24 hours.
    c. Perform additional moisture tests recommended by manufacturer. Proceed with application only after substrates pass testing.

4. Verify that concrete substrates have neutral Ph and that resinous flooring will adhere to them. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.

C. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.

D. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.

E. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written recommendations. Allowances should be included for Stonflex MP7 joint fill material, and CT5 concrete crack treatment.

3.3 APPLICATION

A. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.

1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
3. At substrate expansion and isolation joints, provide joint in resinous flooring to comply with resinous flooring manufacturer's written recommendations.

    a. Apply joint sealant to comply with manufacturer's written recommendations.

B. Apply primer where required by resinous system, over prepared substrate at manufacturer's recommended spreading rate.

C. Integral Cove Base: Stonshield cove mortar, apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details including those for taping, mixing, priming, troweling, sanding, of cove base. Round internal and external corners.

1. Integral Cove Base: In height indicated on the Drawings.

D. Apply metal trowel single mortar coat in thickness indicated for flooring system. Hand or power trowel and grout to fill voids. When cured, sand to remove trowel marks and roughness.

E. Undercoat: Remove any surface irregularities by lightly abrading and vacuuming the floor surface. Mix and apply undercoat with strict adherence to manufacturer's installation procedures and coverage rates.

F. Broadcast: Immediately broadcast quartz silica aggregate into the undercoat using manufacturer's specially designed spray caster. Strict adherence to manufacturer's installation procedures and coverage rates is imperative.

G. Apply topcoat(s) in number of coats indicated for flooring system and at spreading rates recommended in writing by manufacturer.

3.4 TERMINATIONS

A. Chase edges to “lock” the flooring system into the concrete substrate along lines of termination.

B. Penetration Treatment: Lap and seal resinous system onto the perimeter of the penetrating item by bridging over compatible elastomer at the interface to compensate for possible movement.

C. Trenches: Continue flooring system into trenches to maintain monolithic protection. Treat cold joints to assure bridging of potential cracks.

D. Treat floor drains by chasing the flooring system to lock in place at point of termination.

3.5 JOINTS AND CRACKS

A. Treat control joints to bridge potential cracks and to maintain monolithic protection.

B. Treat cold joints and construction joints to bridge potential cracks and to maintain monolithic protection on horizontal and vertical surfaces as well as horizontal and vertical interfaces.

C. Discontinue floor coating system at vertical and horizontal contraction and expansion joints by installing backer rod and compatible sealant after coating installation is completed. Provide sealant type recommended by manufacturer for traffic conditions and chemical exposures to be encountered.

END OF SECTION 09 67 23

SECTION 09 68 13 - TILE CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract."

1.2 SUMMARY

A. Section Includes:

1. Modular carpet tile.

B. Related Requirements:

1. Section 096513 "Resilient Base and Accessories" for resilient wall base and accessories installed with carpet tile.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to carpet tile installation including, but not limited to, the following:

a. Review delivery, storage, and handling procedures.
b. Review ambient conditions and ventilation procedures.
c. Review subfloor preparation procedures.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 "Submittal Procedures."

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
2. Include manufacturer's written installation recommendations for each type of substrate.

B. Sustainable Product Certification: Provide ANSI/NSF 140 certification for carpet products.

C. Shop Drawings: For carpet tile installation, plans showing the following:

1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
2. Carpet tile type, color, and dye lot.
3. Type of subfloor.
4. Type of installation.
5. Pattern of installation.
6. Pattern type, location, and direction.
7. Pile direction.
8. Type, color, and location of insets and borders.
9. Type, color, and location of edge, transition, and other accessory strips.
10. Transition details to other flooring materials.

D. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

1. Carpet Tile: Full-size Sample.
2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch-long Samples.

E. Product Schedule: For carpet tile. Use same designations indicated on Drawings.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For carpet tile, for tests performed by a qualified testing agency.

C. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:

1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 "Quality Requirements."

B. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.

C. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Build mockups at locations and in sizes shown on Drawings.

2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Comply with the Carpet and Rug Institute's CRI 104.

1.10 FIELD CONDITIONS

A. Comply with the Carpet and Rug Institute's CRI 104 for temperature, humidity, and ventilation limitations.

B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants during the remainder of the construction period.

C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.

D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.11 WARRANTY

A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.

1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
2. Failures include, but are not limited to, the following:

a. More than 10 percent edge raveling, snags, and runs.
b. Dimensional instability.
c. Excess static discharge.
d. Loss of tuft-bind strength.
e. Loss of face fiber.
f. Delamination.

3. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CARPET TILE

A. Basis-of-Design Product: Subject to compliance with requirements, provide Ice Breaker Series carpet tile as manufactured by Interface LLC, or comparable product by one of the following:

1. Mohawk Group (The); Mohawk Carpet, LLC.
2. Tandus; a Tarkett company.
3. Or approved equal.

B. Color: As indicated by manufacturer's designations.

C. Fiber Content: 100 percent nylon 6, 6 unless otherwise indicated by manufacturer's designations.

D. Pile Characteristic: Level-loop unless otherwise indicated by manufacturer's designations pile.

E. Pile Thickness: As indicated by manufacturer's designations for finished carpet tile according to ASTM D6859.

F. Primary Backing/Backcoating: Manufacturer's standard composite materials.

G. Secondary Backing: Manufacturer's standard material.

H. Size: 24 inches by 24 inches.

I. Applied Treatments:

1. Soil-Resistance Treatment: Manufacturer's standard treatment unless soil resistance is integral to carpet fiber.
2. Antimicrobial Treatment: Manufacturer's standard treatment unless soil resistance is integral to carpet fiber.

a. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria, not less than 1-mm halo of inhibition for gram-negative bacteria, and no fungal growth, according to AATCC 174.

J. Performance Characteristics:

1. Appearance Retention Rating: Moderate traffic, 2.5 unless otherwise indicated and required by project application minimum according to ASTM D7330.
2. Critical Radiant Flux Classification: Not less than 0.45 W/sq.cm according to NFPA 253.
3. Dimensional Tolerance: Within 1/32 inch 0.8 mm of specified size dimensions, as determined by physical measurement.
4. Dimensional Stability: 0.2 percent or less according to ISO 2551 (Aachen Test).
5. Colorfastness to Crocking: Not less than 4, wet and dry, according to AATCC 165.
6. Colorfastness to Light: Not less than 4 after 40 AFU (AATCC fading units) according to AATCC 16, Option E.
7. Electrostatic Propensity: Less than 3.5 kV according to AATCC 134.

2.2 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation.

1. VOC content: Refer to DDC General Conditions Section 01 81 13.04 “Sustainable Design Requirements for LEED v4 Buildings for VOC Requirements."
2. Adhesive will comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

C. Metal Edge/Transition Strips: Extruded aluminum with mill finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance.

B. Examine carpet tile for type, color, pattern, and potential defects.

C. Concrete Slabs: Verify that finishes comply with requirements specified in Section 033000 "Cast-in-Place Concrete" and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.

1. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft.and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. min 24 hours.
b. Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

c. Perform additional moisture tests recommended in writing by adhesive and carpet tile manufacturers. Proceed with installation only after substrates pass testing.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. General: Comply with the Carpet and Rug Institute's CRI 104 and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider, and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.

C. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.

D. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.4 INSTALLATION

A. General: Comply with the Carpet and Rug Institute's CRI 104, Section 10, "Carpet Tile," and with carpet tile manufacturer's written installation instructions.

B. Installation Method: As recommended in writing by carpet tile manufacturer.

C. Maintain dye-lot integrity. Do not mix dye lots in same area.

D. Maintain pile-direction patterns recommended in writing by carpet tile manufacturer.

E. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

F. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

G. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.

H. Install pattern parallel to walls and borders.

3.5 CLEANING AND PROTECTION

A. Perform the following operations immediately after installing carpet tile:

1. Remove excess adhesive and other surface blemishes using cleaner recommended by carpet tile manufacturer.
2. Remove yarns that protrude from carpet tile surface.
3. Vacuum carpet tile using commercial machine with face-beater element.

B. Protect installed carpet tile to comply with the Carpet and Rug Institute's CRI 104, Section 13.7.

C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 09 68 13

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 09 91 00 – PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Painting of interior and exterior items surfaces, unless otherwise indicated.
2. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

B. Work Not Included:

1. Pre-Finished Items: Do not include painting when shop or factory finishing is specified for such items as elevator, and mechanical and electrical equipment.
2. Concealed Surfaces: Painting is not required on surfaces in concealed and generally inaccessible areas such as pipe spaces, duct shafts and elevator shafts.
3. Operating Parts: Moving parts of mechanical and electrical devices, motor and fan shafts will not require painting.

C. Labels: Do not paint over code required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

1.3 COORDINATION

A. Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify the Commissioner about anticipated problems using the materials specified over substrate primed by other trades.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.5 ACTION SUBMITTALS

A. Product Data: Submit product data that verify or are required to ensure compliance with the Contract Documents, to include technical information, shop drawings, samples, calculations, product test reports, etc.

1. Material List: Provide an inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
2. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).

B. Sustainable Design Submittals:

1. Product Data: For paints and coatings, indicating VOC content.
2. Laboratory Test Reports: For paints and coatings, indicating compliance with requirements for low-emitting materials.
3. Environmental Product Declaration: For each product.
4. Health Product Declaration: For each product.
5. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.

C. Samples: Prior to painting, submit samples for Commissioner review of each required color and texture. Identify materials used on samples. Samples will have each coat of paint exposed the same amount and tinted slightly different than other coats.

1. On 12" by 12" hardboard, submit one sample of each color, material and texture, until sheen, color, and texture are acceptable.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Commissioner will select one surface to represent surfaces and conditions for application of each paint and sealer system.

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
b. Other Items: Commissioner will designate items or areas required.

2. Final approval of color selections will be based on mockups.

a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Commissioner at no added expense to City of New York.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Apply concrete paints only when temperature of surfaces to be sealed and ambient air temperatures comply with sealer manufacturer’s written requirements.

C. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide primers, undercoats finish-coat, and sealer materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

C. VOC Content: For field applications that are inside the weatherproofing system, paints and coatings must comply with VOC content limits of the United States EPA and the following VOC content limits:

1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 50 g/L.
3. Dry-Fog Coatings: 150 g/L.
4. Primers, Sealers, and Undercoaters: 100 g/L.
5. Rust-Preventive Coatings: 100 g/L.
6. Zinc-Rich Industrial Maintenance Primers: 100 g/L.
7. Pretreatment Wash Primers: 420 g/L.

D. Low-Emitting Materials: For field applications that are inside the weatherproofing system, 90 percent of paints and coatings must comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.2 MANUFACTURERS

A. Paint Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Benjamin Moore
2. Sherwin-Williams Company (The).
3. Tnemec.
4. Or approved equal.

B. Sealer Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Seal-Krete.
2. Rustoleum.
3. Behr.
4. Or approved equal.

2.3 PAINT, GENERAL

A. Material Quality: Provide best quality grade of various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable.

1. Compatibility: Provide materials for use within each finish system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

B. Undercoaters: Provide undercoaters recommended by the finish coating manufacturer for suitability with the substrate and compatibility with finish coats.

C. Colors: As selected by Commissioner from manufacturer's full range.

1. Match colors indicated by reference to manufacturer’s standard color designations as scheduled.
2. Gloss: Refer to the Drawings and Finish Schedules for sheen of painted finishes for different substrates.

D. Color Pigments: Pure, non-fading, to suit substrates and service.

1. Lead content in pigment, if any, is limited to contain no more than 0.5% lead, as lead metal based on the total non-volatile (dry-film) of paint by weight.

2.4 INTERIOR PAINT SCHEDULE

A. Water-Based Concrete Floor Sealer: Clear, water-based, acrylic-copolymer-emulsion sealer formulated for oil, gasoline, alkali, and water resistance and for use on concrete traffic surfaces.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Behr Paint Company; Behr Process Corporation.
    b. PPG Paints; PPG Industries, Inc.
    c. Sherwin-Williams Company (The).
    d. Or approved equal.

B. Drywall; Ceiling locations:

1. 100% Flat Vinyl Acrylic Latex Flat Finish: 2 finish coats over a primer.

    a. Primer Coat: Latex-based interior primer (Benjamin Moore's "Eco Spec WB Interior Latex Primer", N372).
    b. Finish Coats: Interior Flat Latex Base Paint (Benjamin Moore's "Eco Spec WB Interior Latex Flat Finish", N373).

C. Gypsum Drywall; Wall locations:

1. 100% Eggshell Acrylic Latex Finish (Low Odor/Low VOC): 2 finish coats over a primer.

    a. Primer Coat: Latex-based interior primer.
    b. Two Coats: Two coats of latex-based interior eggshell finish.

2. 100% Semi-gloss Acrylic Latex Finish (Low Odor/Low VOC): 2 finish coats over a primer.

    a. Primer Coat: Latex-based interior primer.
    b. Two Coats: Two coats of latex-based interior semi-gloss finish.

D. Metal, Ferrous, Piping, Ductwork, Doors, HVAC:

1. 100% Acrylic Latex Finish (Low Odor/Low VOC): Two finish coats over a primer.

    a. Primer: Interior enamel primer.
    b. Two Coats: Two coats of latex-based interior semi-gloss finish.

E. Zinc-coated Metal (Where applicable):

1. 100% Acrylic Latex Finish (Low Odor/Low VOC): Two finish coats over a primer.

    a. Primer: Interior enamel primer.
    b. Two Coats: Two coats of latex-based interior semi-gloss finish.

F. AESS (Architectural Exposed Structural Steel) Finish Carbon Steel

    a. See section 05 12 00 Structural Steel Framing

G. Wood:

1. 100% Acrylic Latex Finish (Low Odor/Low VOC): Two finish coats over a primer.

   a. Primer Coat: Latex-based interior primer.
   b. Two Coats: Two coats of latex-based interior semi-gloss finish.

2.5 EXTERIOR PAINTING SCHEDULE

A. Metal (Ferrous and Non-ferrous Metals):

1. Acrylic, semi-gloss Finish; 2 finish coats.
2. Finish Coats: Semi-gloss acrylic finish.

B. Exterior Decorative Metal Items and Existing Items indicated for Refinishing/Restoration:

1. Primer: Water based acrylic primer.
2. Field Applied Finish Coats: Two coats acrylic polymer; color to match existing.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Fiber-Cement Board: 12 percent.
3. Masonry (Clay and CMUs): 12 percent.
4. Wood: 15 percent.
5. Gypsum Board: 12 percent.
6. Plaster: 12 percent.

C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

D. Plaster Substrates: Verify that plaster is fully cured.

E. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

F. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.3 PREPARATION

A. Do not begin to apply paint until unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.

1. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

B. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.

1. Ferrous Metals: Clean nongalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council.

a. Blast steel surfaces clean as recommended by the paint system manufacturer and in accordance with requirements of SSPC specification SSPC-SP 10 for interior surfaces and SSPC-SP 6 for exterior surfaces.
b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.

2. Galvanized Surfaces: Touch-up bare and damaged areas of the shop-applied prime coat that have been damaged; wire brush, mechanically clean and/or solvent clean such areas in compliance with the manufacturer's recommendations.

a. Use the coating materials identical to those applied in the shop. Refer to other Sections of these specifications for materials and other requirements.

3. Cementitious Materials: Prepare concrete and concrete masonry block surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen, as required, to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
4. Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.
5. Wood Substrates:

a. Scrape and clean knots and apply coat of knot sealer before applying primer.
b. Sand surfaces that will be exposed to view and dust off.
c. Prime edges, ends, faces, undersides, and backsides of wood.
d. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

C. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.4 APPLICATION

A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

B. The number of coats and the film thickness required are the same regardless of application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.

C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.

E. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime coated by other trades. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn through or other defects due to insufficient sealing.

F. Where new painting work will be applied to adjacent existing surfaces, or within existing rooms or areas, provide colors to match as directed by the Commissioner or indicated on the Drawings. Match colors of approved samples prior to start of painting.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Commissioner, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

END OF SECTION 09 91 00

SECTION 10 11 00 - VISUAL DISPLAY UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Field assembled bulletin boards (tackable surfaces).
2. Frames and trim.
3. Installation accessories.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for visual display surfaces.

1. Include individual panel weights for visual display units.

B. Sustainable Design Submittals:

1. Product Data: For adhesives, indicating VOC content.
2. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low emitting materials.

C. Shop Drawings: For visual display surfaces. Include plans, elevations, sections, details, and attachments to other work.

1. Show locations of panel joints.
2. Show locations of special-purpose graphics for visual display surfaces.
3. Include sections of typical trim members.

D. Samples for Initial Selection: For each type of visual display surface indicated, for units with factory-applied color finishes, and as follows:

1. Actual sections of visual display surface.

2. Include accessory Samples to verify color selected.

E. Samples for Verification: For each type of visual display surface indicated.

1. Visual Display Surface: Not less than 8-1/2 by 11 inches. Include one panel for each type, color, and texture required.

2. Trim: 6-inch- long sections of each trim profile.

3. Accessories: Full-size Sample of each type of accessory.

F. Product Schedule: For visual display surfaces.

G. Qualification Data: For qualified Installer.

H. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for surface-burning characteristics of fabrics.

I. Maintenance Data: For visual display surfaces to include in maintenance manuals.

J. Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 "Quality Requirements."

B. Source Limitations: Obtain visual display surfaces from single source from single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store visual display surfaces materials in compliance with materials manufacturer's written instructions.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install visual display surfaces materials until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

B. Field Measurements: Verify actual dimensions of construction contiguous with visual display surfaces by field measurements before fabrication.

1. Allow for trimming and fitting where taking field measurements before fabrication might delay the Work.

1.8 WARRANTY

A. Manufacturer's Special Warranty for Visual Display Units: the manufacturer agrees to replace visual display units that deteriorate within specified warranty period.

B. Warranty Period: 2 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface- Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings from an applicable testing agency.

1. Flame- Spread Index: 25 or less.

2.2 TACKABLE SURFACE

A. Product Description: Pinboard linoleum.

1. Natural materials: 91 percent, cork, linseed oil, jute.

a. PVC, PET, plasticizers contents: 0 percent.
b. Recycled content: 43 percent.
c. Total thickness: 6.0 mm ± 0.25 mm.
d. Total Weight: 4.7 kg per sq. m ± 10 percent.

2. Basis-of-Design Product: Subject to compliance with requirements, provide Tackable surface Tac-Wall as manufactured by Koraseal, or comparable product by one of the following:

a. AJW Architectural Products.
b. Bangor Cork.
c. Or approved equal.

3. Dimensions: As indicated on the Drawings.
4. Color: As scheduled.

B. Extruded Aluminum: ASTM B221, Alloy 6063.

1. Aluminum Frames and Trim: Fabricated from not less than 0.062-inch- thick, extruded aluminum; of size and shape indicated on Drawings.

a. Field-Applied Trim: Manufacturer's standard J and H trims, and inside and outside trim.
b. Aluminum Finish: Match Commissioner's samples.

C. Adhesives for Field Application: Mildew-resistant, nonstaining adhesive for use with specific type of panels, sheets, or assemblies; and for substrate application; as recommended in writing by visual display unit manufacturer.

1. Verify adhesives have a VOC content of 50 g/L or less.

2. Adhesive must comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers."

2.3 ACCESSORIES

A. Provide clips, anchors and fasteners required for complete installation.

2.4 FABRICATION

A. Visual Display Boards: Fabricate visual display boards on site unless otherwise directed by the Commissioner.

B. Field-Assembled Visual Display Board Units: Coordinate field-assembled units with trim and accessories indicated. Join parts with a neat, precision fit.

1. Make joints only where total length exceeds maximum manufactured length. Fabricate with minimum number of joints, balanced around center of board, as acceptable to Commissioner.

2. Provide manufacturer's standard vertical-joint spline system between abutting sections unless otherwise indicated.

3. Where size of visual display boards or other conditions require support in addition to normal trim, provide structural supports or modify trim as indicated or as selected by Commissioner from manufacturer's standard structural support accessories to suit conditions indicated.

C. Aluminum Frames and Trim: Fabricate units straight and of single lengths, keeping joints to a minimum. Miter corners to a neat, hairline closure.

2.5 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.6 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.

B. Examine walls and partitions for proper preparation and backing for visual display surfaces.

C. Examine walls and partitions for suitable framing depth where sliding visual display units will be installed.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Comply with manufacturer's written instructions for surface preparation.

B. Clean substrates of substances that could impair the performance of and affect the smooth, finished surfaces of visual display boards, including dirt, mold, and mildew.

3.4 INSTALLATION, GENERAL

A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below.

B. Keep perimeter lines straight, level, and plumb.

C. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.

3.5 CLEANING AND PROTECTION

A. Clean visual display surfaces according to manufacturer's written instructions. Attach one cleaning label to visual display surface in each room.

B. Touch up factory-applied finishes to restore damaged or soiled areas.

C. Cover and protect visual display surfaces after installation and cleaning.

END OF SECTION 10 11 00

SECTION 10 14 00 – SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section includes:

1. Exterior Signage
2. Exterior Banner mounting system
3. Interior Signage
4. Slatwall display system

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification: For each type of exposed finish and for each color and texture specified, include samples of finish, color swatches and final sign samples of tactical letters and typical sign type.

C. Shop Drawings: Complete shop drawings must be prepared by the Fabricator for all sign types calling out, in detail, specifications and dimensions including all message schedules and full size sections of typical sign types.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: include in maintenance manuals banner support system.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Mockups: Complete mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1. Build mockup of typical signage type.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Commissioner specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

C. Unless noted otherwise, all signs, where applicable, must comply with applicable provisions in the USDOJ's 2010 ADA Standards for Accessible Design and ICC A117.1-2009 guidelines in respect to type size, tactile lettering and Braille usage, and mounting heights.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver signs, signage components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing signs, permit them to reach room temperature and a stabilized moisture content.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not install signage until spaces are enclosed and weathertight, wet-work including painting in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.10 WARRANTY

A. Manufacturer's Special Warranty for Signage: manufacturer agrees to replace units that deteriorate within specified warranty period. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1. Warranty Period: 3 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Signage to be made from materials as described in the signage program.

2.2 SIGN STANDARDS

A. Typography

1. Type Style: Copy must be a true, clean, accurate reproduction of typeface selected by the Commissioner. Upper and lower case or all caps as indicated in the drawings. Letter spacing to be normal and interline spacing must be set by manufacturer.
2. Arrows, Symbols and Logo Art: To be provided in style, sizes, colors and spacing as shown in drawings.
3. Braille: Grade 2.
4. Translations: Grade 2 Braille copy, as noted in the drawings, is responsibility of the sign manufacturer.
5. Unless noted otherwise, all signs, where applicable, must comply with ADA guidelines in respect to type size, tactile lettering and Braille usage, and mounting heights.
6. All letter forms must be aligned to maintain a base line parallel to the sign format. The typeface must conform with sections including colors. Alternate type will not be accepted.
7. Letter and word spacing must be optical but in conformance with the examples shown on the drawings. Complete alphabets, numbers, punctuation, and symbols must be submitted to the Commissioner for approval prior to any fabrication.
8. All letters, regardless of material or process, must be executed in such a manner that all edges and corners of finished letterforms are true and clean. Letterforms with rounded positive and negative corners, edge build-up or bleeding will not be accepted.

2.3 EXTERIOR BANNER MOUNTING SYSTEM

A. Black textured powder coated 30” steel straight arm banner supports to be secured to existing brick façade with powder coated eye bolts secure to secure banner. Banner hardware to include an eye and bolt and be coordinated with the banner hanging pocket.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Sign Bracket Store
2. Vispronet
3. Victorystore
4. Or approved equal.

2.4 SLAT WALL SYSTEM

A. Provide clear anodized aluminum slat wall system, with extruded aluminum channels, flush starter system and aluminum vertical edge trim.

B. Provide Brushed Aluminum Slatwall with METAL INSERTS, and concealed fastener system

C. Basis-of-Design Product: Subject to compliance with requirements, provide "Monarch; 3-inch Slat Wall" or comparable product by one of the following:

1. Allen Display
2. Hubert
3. Or approved equal.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions, including all surfaces to which signage will attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect signage installation and anchorage and with requirements for installation tolerances and other conditions affecting placement.

B. The Fabricator must verify all measurements and take all field measurements necessary before fabrication. The Fabricator must provide all materials and parts necessary to complete each sign type, even though such work is not definitely shown or specified. The Fabricator must provide all bolts, and anchors, support, braces, connections, and other items necessary for completion of the work. The Fabricator must form signs to shape and size with clean, clear, sharp lines and angles. Drilled holes for bolt or screw fasteners must have clean, true lines and surfaces.

C. Proceed with installation only after unsatisfactory conditions have been corrected and surfaces are dry.

3.3 INSTALLATION

A. General: Mounting height to be field verified.

B. Install using methods indicated on documents as appropriate for substrate.

C. Exposed surfaces of work must have a smooth finish, free of blemishes. Where tight fit is required, joints are to be made to a close fit. Work must be accurately set to established lines and elevations and securely fastened into place. Work must be executed and finished in accordance with approved drawings, cuts, details, and samples. Visible screw heads and fasteners must occur only at locations indicated on the drawings and approved submittals. All edges and corners of finished letter forms and graphics are to be true and clean.

D. Each sign must be located typically as indicated on the sign drawing sheet. Conditions that may exist which prevent location of signage as specified must be brought to the Commissioner's attention prior to installation.

E. Finished work must be wrapped with paper, polyethylene film, or stripable waterproof tape for shipment and storage and protection for damage during installation.

3.4 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.

B. Protect signage from breakage and contamination resulting from construction operations.

C. Remove and replace components that cannot be successfully cleaned and restored to permanently eliminate evidence of damage. Signs which cannot be repaired to a new condition must be replaced. All sign surfaces must be clean, free of smudging and fingerprinting. All hardware and electrical equipment are to be adjusted to assure safe and proper operation and installation. All waste and debris to be discarded.

END OF SECTION 10 14 00

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 10 22 39 – FOLDING PANEL PARTITIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Manually operated, single panel partitions.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 SUBMITTALS

A. Product Data: Submit product data on physical characteristics, durability, acoustical and surface-burning characteristics for each type of operable panel partition, track system and accessories specified.

B. Shop Drawings: Provide shop drawings indicated all required supports and mounting assemblies to secure operable partitions to building structure, submit required calculations, signed and sealed by a Professional Engineer, licensed in the State of New York for items required herein and where items are structurally designed or engineered by the manufacturer and Installer.

C. Template Drawings: Submit template drawings prepared by manufacturer showing location of items supported or anchored by permanent construction.

D. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

1. Suspended ceiling components.
2. Structural members to which suspension systems will be attached.
3. Size and location of initial access modules for acoustical tile.

E. Samples: Submit samples for verification purposes of each type of panel finish face indicated; in sets for each color, texture, and pattern specified, showing a full range of variations expected in these characteristics.

1. Finish Face Fabric: 8 x 8 inches long, with specified treatments applied. Show complete pattern repeat.

2. Panel Edge Material: Manufacturer's standard size unit, not less than 3 inches square.

F. Product Certificates: Submit product certificates signed by manufacturers of operable panel partitions certifying that their products comply with specified requirements.

G. Maintenance Data: Submit maintenance data for panel finish face to include in the following:

1. Precautions for cleaning materials and methods that could be detrimental to finishes and performance.
2. Instructions for restretching sagging or distorted finish face.

H. Test Reports: Submit acoustical test reports from and based on tests performed by a qualified independent testing agency certifying that the product and materials furnished comply with specified requirements.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Installer Qualifications: Engage an experienced Installer who is certified in writing by the operable panel partition manufacturer as qualified to install the manufacturer's partition systems.

C. Testing Agency Qualifications: To qualify for acceptance, an independent testing agency must demonstrate to the Commissioner’s satisfaction, based on an evaluation of agency-submitted criteria conforming to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying progress of the Work.

D. Surface-Burning Characteristics: Provide panel finish face with the following surface-burning characteristics as determined by testing identical products per ASTM E84 and E152 by UL.

1. Flame Spread: 25 or less.
2. Smoke Developed: 450 or less.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protectively package and sequence panels in order for installation. Clearly mark packages and panels with numbering system used on Shop Drawings. Do not use permanent markings on panels.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of operable panel partition openings by field measurements before fabrication.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of operable panel partitions that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:

      a. Faulty operation of operable panel partitions.
      b. Deterioration of metals, metal finishes, and other materials beyond normal wear.

   2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SYSTEM PERFORMANCE REQUIREMENTS

A. Engineering Requirements: Design operable panel partitions, including comprehensive engineering analysis by a qualified professional engineer, licensed in the State of New York using performance requirements and design criteria indicated.

B. Seismic Performance: Operable panel partitions will withstand the effects of earthquake motions determined according to SEI/ASCE 7.

   1. The term "withstand" means "the panels will remain in place without separation of any parts from the system when subjected to the seismic forces specified."
   2. Contractor will provide all additional framing and supports to existing construction as required.

C. Acoustical Performance: Provide operable panel partitions tested by a qualified independent testing agency for the following acoustical properties according to following test method:

   1. Sound Transmission Requirements: Operable panel partition assembly tested in a full-scale opening (14 feet by 9 feet) for laboratory sound transmission loss performance according to ASTM E 90, determined by ASTM E 413 and rated for an STC plus or minus 1 as follows:

      a. Sound Transmission Class (STC): 50, unless otherwise indicated.

2.2 MANUFACTURERS

A. Basis of Design Product: Subject to compliance with requirements, provide “Acousti- Seal Series 931” as manufactured by Modernfold, Inc. or comparable product by one of the following:

   1. Panelfold.
   2. Moderco.
   3. Or approved equal.

2.3 OPERABLE ACOUSTICAL PANEL PARTITION SYSTEM

A. Panel Configuration: Operable panels as follows:

1. Manually operated, individual panels.

B. Panel Construction: Min 3 inch thick panel; in manufacturers standard 48 inch width maximum. Panel weight will be Max 8 lb./sq.-ft., unless otherwise indicated. Top reinforcing as required to support suspension components and as follows:

1. Steel Frame: Formed steel channel frame, of gauge and dimensions as standard with the manufacturer or as required to support panel materials.

a. Panel Skin: 0.50-inch NAUF medium density fiberboard, single material or composite layers continuously bonded to panel frame. Acoustical ratings of panels with this construction:

1) STC: Not less than 52.

2. Edge Assemblies: Frame is designed so that full vertical edges of panels are of formed steel and provide protection of the edges of the panel skin.
3. Hinges for Closure Panels, Pass Doors, and Pocket Doors will be full leaf butt hinges, attached directly to the panel frame. Welded hinge anchor plates within panel will further support hinge mounting to frame. Hinges mounted into panel edge or vertical astragal are not acceptable.
4. Dimensions: Fabricate operable acoustical panel partitions to form an assembled system of dimensions indicated and verified by field measurements.
5. Panel Width: Equal widths, unless otherwise indicated.

C. Clearances: Provide clearances between panel bottom and finished floor covering of 1/2 inch, between panel top and metal soffit construction of 1/2 inch, unless otherwise indicated.

D. Pass Door: Manufacturer's standard design in location shown.

2.4 FINISH SURFACE

A. Panel finish will be factory applied, class "A" rated material by manufacturer.

1. Provide fabric and full height steel markerboard finish material as selected by the Commissioner. Fabric will match colors, textures, and patterns of the approved samples.
2. Panel finish will be factory applied, Class "A" rated material. Finish will be reinforced vinyl with woven backing weighing not less than 15 ounces per lineal yard.
3. Panel Trim: Exposed panel trim of one color: Smoke Gray.

a. Provide no panel trim at full height steel markerboard surface finish.

2.5 SEALS

A. Sound Seal: Vertical interlocking sound seals between panels(astragals), reversible tongue and groove configuration inside each panel edge. Astragals will be steel for maximum durability and fire resistance

B. Horizontal Top Seals: Continuous contact extruded vinyl bulb shape with vinyl fingers to prevent distortion and no mechanically operated parts.

C. Horizontal Bottom Floor Seals: Manually operated seals with self-contained handle providing nominal 2 inch operating clearance with an operating range of plus 1/2 inch to minus 1-1/2 inches.

2.6 SUSPENSION SYSTEMS

A. Basis of Design Product: Subject to compliance with requirements, provide low profile "#17 Suspension System", as manufactured by Modernfold, Inc. or comparable product by one of the following:

1. Panelfold.
2. Moderco.
3. Or approved equal.

B. Carriers: Steel carrier system as required for type, size, and weight of partition for ease of operation.

1. Right Angle Turn: Two carriers of low-friction polymer, reinforced with steel, that permit panels to traverse L, T, and X intersections without mechanical switching, on all panels except hinged closure panels.
2. Color: Color as selected by Commissioner.

C. Suspension Tracks: Steel or aluminum with overhead supports of adjustable steel hanger rods designed for size and type of operable panel partition assembly indicated. Track deflection will be no more than 0.10 inch between bracket supports.

1. Provide track type to match operation and model selected.

D. Provide additional steel framing required to support and brace track assembly to structure above.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine flooring, structural support, and opening for compliance with requirements for installation tolerances and other conditions affecting performance of operable panel partitions.

B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Install operable panel partitions and accessories complying with ASTM E 557 after other finishing operations including painting, have been completed.

B. Install operable panel partitions that conform to Drawings and approved shop drawings and in strict compliance with manufacturer's written installation instructions.

C. Match operable panel partitions for color and pattern by installing partitions from cartons in same sequence as manufactured and packaged, if so numbered. Broken, cracked, chipped, or deformed panels are not acceptable.

D. Repair or replace operable panel partitions within areas where test results indicate partitions do not comply with requirements and retest new partitions.

3.4 ADJUSTING

A. Lubricate bearings and sliding parts; adjust to ensure smooth, easy operation.

3.5 DEMONSTRATION

A. Startup Services: Provide the services of a factory-authorized service representative to provide start-up service and to demonstrate and instruct the City of New York's staff.

END OF SECTION 10 22 39

SECTION 10 28 13 – TOILET ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Public and staff use washroom accessories.
2. Warm-air dryers.
3. Childcare accessories.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 COORDINATION

A. Coordinate requirements for blocking, reinforcing, and other supports concealed within walls.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.6 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For manufacturer's special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For accessories to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

1.9 WARRANTY

A. Manufacturer's Special Warranty for Mirrors: Manufacturer agrees to restore or replace mirrors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, visible silver spoilage defects.
2. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 MANUFACTURERS

A. Toilet Accessories:

1. Sole Source Product: Toilet Paper Dispenser (TP1): Kimberly Clark, Model #09551.

   a. No substitutions permitted.
   b. Material and Finish: Stainless steel, No. 4 finish (satin).

2. Sole Source Product: Toilet Seat Cover Dispenser (TSC1): Kimberly Clark, Model #09506.

   a. No substitutions permitted.
   b. Material and Finish: Stainless steel, No. 4 finish (satin).

3. Sole Source Product: Paper Towel Dispenser (PTD1): Kimberly Clark, Model #KCC09990.

   a. No substitutions permitted.

4. Sole Source Product: Hand Dryer (HD1): World Dryer, Item #485D17, Manufacturer Model #L-973.

   a. No substitutions permitted.
   b. Surface mounted, stainless steel cover, push button activated, 115-volt, 20 amp.

5. Sole Source Product: Grab Bars (GB1): Bobrick, Model #B-5806x18, #B-5806x36, #B-5806x42.

   a. No substitutions permitted.

6. Sole Source Product: Childcare Accessories (BCT1): Koala Kare Products, Manufacturer Model #KB300.

   a. No substitutions permitted.

b. Baby- changing Station: Horizontal type.
c. Material and Finish: Injection molded polypropylene, Color: 01 - Grey

7. Sole Source Product: Soap Dispenser (SD1): Kimberly Clark, Model #P-N1000 FOAM-CB-PAP.

   a. No substitutions permitted.

8. Sole Source Product: Sanitary Waste Receptacle (SWR1): Grainger Tough Guy, Model #1ECK9, Catalog #1494.

   a. No substitutions permitted.

9. Sole Source Product: Mirror Unit (M1): Bobrick, Model #B-165 2436.

   a. No substitutions permitted.

10. Sole Source Product: Mirror Unit (M1a): Bobrick, Model #B-165 2430.

    a. No substitutions permitted.

2.3 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, 0.0312-inch minimum nominal thickness, unless otherwise indicated.

B. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.

C. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

D. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

E. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

F. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

2.4 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to the Commissioner.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to method in ASTM F 446.

3.3 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 10 28 13

SECTION 10 44 00 – FIRE PROTECTION SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section includes:

1. Fire extinguisher cabinets for City of New York supplied fire extinguishers.

1.3 COORDINATION

A. Coordinate sizes and locations of fire-protection cabinets with wall depths.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.5 ACTION SUBMITTALS

A. Shop Drawings: Provide the following for each joint system specified:
   1. General: Show connections of units and hardware to other Work. Include schedules showing location of each type and size of door and panel units.

B. Product Data: Manufacturer's technical data for each type of access door and panel assembly, including setting drawings, templates, fire-resistive characteristics, finish requirements, and details of anchorage devices.

   1. Include complete schedule, types, locations, construction details, finishes, latching or locking provisions, and other pertinent data.

C. Manufacturer's Installation Instructions: Indicate installation requirements and rough-in dimensions.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. NFPA 10 requirements for portable fire extinguishers.

C. 2010 ADA Standards for maximum cabinet projection of 4 inches and mounting heights.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Strike First Corporation of America
2. Kidde Safety Company
3. Larson's manufacturing company
4. Or approved equal.

2.2 FIRE EXTINGUISHER CABINETS

A. Description: Steel unit construction, continuous piano hinge with 180 degree opening.

1. Cabinet Mounting: Semi-Recessed
2. Components:
   a. Door and Frame:
      1) 6063-T5 anodized aluminum.
         a) Color and Finish: Satin finish, clear polyester coated.
   b. Tub: 0.036 inch cold rolled steel
      1) Color Finish: White factory applied powder coat paint finish.
   c. Door Type: Full glass with tempered safety glass.
3. Accessories:
   a. Lettering: Vertical die cut, black
   b. Chrome handle with safety break lock
4. Cabinet Dimensions: Size to match extinguisher type.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine surfaces where cabinets will be installed for installation tolerances and other conditions affecting performance of the Work.

B. Verify that rough openings for cabinets are correctly sized and located.

3.3 PREPARATION

A. Coordinate work relating to fire extinguisher cabinet installation including rough opening dimensions and locations of supports.

3.4 INSTALLATION

A. Prepare recesses in walls for fire extinguisher cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.

B. Securely fasten mounting brackets and fire extinguisher cabinets to structure, square and plumb, to comply with manufacturer's instructions.

3.5 PROTECTION

A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.

END OF SECTION 10 44 00

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 10 75 00 - FLAGPOLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Ground-mounted flagpoles made from aluminum.
2. City of New York-Furnished Material: Flags.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, operating characteristics, fittings, accessories, and finishes for flagpoles.

B. Shop Drawings: For flagpole. Include plans, elevations, details, and attachments to other work. Show general arrangement, jointing, fittings, accessories, grounding, anchoring, and support.

1. Include section, and details of foundation system for ground-mounted flagpole.

C. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

D. Submittal: For flagpole assembly indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer licensed in the State of New York responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified professional engineer license in the State of New York.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For flagpoles to include in operation and maintenance manuals.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Source Limitations: Obtain flagpole as complete unit, including fittings, accessories, bases, and anchorage devices, from single source from single manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

A. General: Spiral wrap flagpole with heavy paper and enclose in a hard fiber tube or other protective container.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Product: Subject to compliance with requirements, provide "Continental ESR Series" as manufactured by Concord American Flagpole or comparable product by one of the following:

1. American Flagpole; a Kearney-National Inc. Company.
2. U.S. Flag & Flagpole Supply, LP.
3. Or approved equal.

B. Refer to the Drawings for additional information.

2.2 PERFORMANCE REQUIREMENTS

A. Engineering Requirements: Design flagpole, including comprehensive engineering analysis by a qualified professional engineer, licensed in the State of New York using performance requirements and design criteria indicated.

B. Structural Performance: Flagpole assembly, including anchorages and supports, will withstand the effects of gravity loads, and the following loads and stresses within limits and under conditions indicated according to the following design criteria:

1. Wind Loads: Determine according to NAAMM FP 1001. Basic wind speed for Project location is based on the Project location and the 2014 New York City Building Code.
2. Base flagpole design on polyester, nylon or cotton flags of maximum standard size suitable for use with flagpole or flag size indicated, whichever is more stringent.

2.3 FLAGPOLE

A. Flagpole Construction, General: Construct flagpole in one piece.

B. Exposed Height: As indicated.

C. Aluminum Flagpole: Provide one piece, cone tapered flagpoles fabricated from seamless extruded tubing complying with ASTM B 241/B 241M, Alloy 6063-T5, with a minimum wall thickness of 0.188 inch.

D. Foundation Tube: Galvanized corrugated steel foundation tube, .0635”-16 gage minimum wall thickness, sized to suit flagpole and installation. Provide with 3/16” steel bottom plate and steel centering wedges. Furnish with 3/16” support plate, ¾” diameter x 18” long steel ground lightning spike. Foundation tube will consist of all welded construction.

2.4 FITTINGS

A. Finial Ball: Manufacturer's standard flush-seam ball, sized as indicated or, if not indicated, to match flagpole-butt diameter.

1. 0.063-inch satin aluminum, finished to match flagpole.

B. Ground-mounted pole: Internal Halyard, Winch System: Manually operated winch with control stop device and removable handle, stainless-steel braided aircraft type cable halyard, and concealed revolving truck assembly with plastic-coated counterweight and sling. Finish truck assembly to match flagpole.

1. Halyard Flag Snaps: Provide two stainless-steel swivel snap hooks per halyard.

C. Flash Collar: Provide Spun Aluminum Collar to match flagpole.

D. Single Revolving Truck Assembly: Cast aluminum non-fouling revolving with single pulley and pin, stainless steel roller bearings, and threaded aluminum spindle for attachment to pole top.

E. Halyard: Provide one (1) continuous 5/16” (#10) polyester halyard.

F. Halyard Flag Snaps: Provide two (2) solid brass swivel flagsnaps with neoprene covers.

G. Cleat(s): Provide one (1) heavy-duty cast aluminum cleat (9”) with stainless steel attaching screws

2.5 MISCELLANEOUS MATERIALS

A. Non-shrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.

B. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.6 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 ALUMINUM FINISHES

A. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44.

1. Color: Black.
2. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, including foundation; accurate placement, pattern, orientation of anchor bolts, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Prepare uncoated metal flagpole that is set in foundation tube by painting below-grade portions with a heavy coat of bituminous paint.

B. Foundation Excavation: Excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete. Place and compact drainage material at excavation bottom.

C. Provide forms where required due to unstable soil conditions and for perimeter of flagpole base at grade. Secure and brace forms to prevent displacement during concreting.

D. Place concrete, as specified in Division 3 Section "Cast-in-Place Concrete." Compact concrete in place by using vibrators. Moist-cure exposed concrete for not less than seven days or use non-staining curing compound.

E. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks, and uniform in texture and appearance. Provide positive slope for water runoff to perimeter of concrete base.

3.4 FLAGPOLE INSTALLATION

A. General: Install flagpole where shown and according to shop Drawings and manufacturer's written instructions.

B. Ground Set: Place foundation tube, center, and brace to prevent displacement during concreting. Place concrete. Plumb and level foundation tube and allow concrete to cure. Install flagpole, plumb, in foundation tube.

1. Foundation Tube: Place tube seated on bottom plate between steel centering wedges and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch layer of elastomeric joint sealant and cover with flashing collar.

C. Baseplate: Cast anchor bolts in concrete foundation. Install baseplate on washers placed over leveling nuts on anchor bolts and adjust until flagpole is plumb. After flagpole is plumb, tighten retaining nuts and fill space under baseplate solidly with non-shrink, nonmetallic grout. Finish exposed grout surfaces smooth and slope 45 degrees away from edges of baseplate.

D. Mounting Brackets and Bases: Anchor brackets and bases securely through to structural support with fasteners as indicated on Shop Drawings.

END OF SECTION 10 75 00

THIS PAGE LEFT INTENTIONALLY BLANK

SECTION 11 30 13 – RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Pantry appliances as schedules on drawings.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include installation details, material descriptions, dimensions of individual components, and finishes for each appliance.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

B. Sustainable Design Submittals:

1. ENERGY STAR: Product Data for indicated products, showing compliance with requirements for ENERGY STAR product labeling.

C. Product Schedule: For appliances. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of appliance.

B. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each residential appliance to include in operation and maintenance manuals.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Source Limitations: Obtain each type of residential appliance from single manufacturer.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrical Appliances: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Accessibility: Where residential appliances are indicated to comply with accessibility requirements, comply with applicable provisions in the DOJ's 2010 ADA Standards for Accessible Design and ICC A117.1-2009.

2.2 APPLIANCES

A. Basis of Design Products: Subject to compliance with requirements, provide products by General Electric or comparable products by one of the following:

1. Maytag.
2. Kenmore.
3. Or approved equal.

2.3 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, power connections, and other conditions affecting installation and performance of residential appliances.

B. Examine roughing-in for piping systems to verify actual locations of piping connections before appliance installation.

C. Examine walls, ceilings, and roofs for suitable conditions where overhead exhaust hoods and microwave ovens with vented exhaust fans will be installed.

D. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Install appliances according to manufacturer's written instructions.

B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and that rough openings are completely concealed.

C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.

D. Range Anti-Tip Device: Install at each range according to manufacturer's written instructions.

3.4 FIELD QUALITY CONTROL

A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Perform visual, mechanical, and electrical inspection and testing for each appliance according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.
2. Leak Test: After installation, test for leaks. Restore areas and items with leaks and retest until no leaks exist.
3. Operational Test: After installation, start units to confirm proper operation.
4. Test and adjust controls and safety. Replace damaged and malfunctioning controls and components.

B. An appliance will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to instruct the City of New York's service staff to adjust, operate, and service residential appliances.

END OF SECTION 11 30 13

SECTION 11 51 00 – LIBRARY EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Automated Material Handling Systems- Fabrication and Installation of patron returns and sorter including conveyors.
2. Radio Frequency Identification gates

B. Related Sections:

1. Section 09 29 00 "Gypsum Board."

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Maintenance Data: Include maintenance manuals.

C. Operational Data: Include operational manuals.

1.5 INFORMATIONAL SUBMITTALS

A. Shop Drawings: Showing the following for the Automated material handling System

1. Provide shop drawings showing the material handling machine, all conveyors, radio frequency identification gates and other accessories. Include notation of coordination required with other trades, especially electrical, and all electrical connections that will be required.
2. Include plans, elevations, sections, and details indicating coordination with building structure.
3. Indicate maximum loads imposed on building structure at points of support.

4. Indicate power and data requirements.
5. Indicate access space.
6. Indicate choices of finishes and materials.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 "Quality Requirements."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect equipment according to manufacturer's written instructions and as needed to prevent damage from moisture, condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with manufacturer's written instructions for shipping, storing, and handling as needed to prevent damage to finishes, and abrasion of surfaces. Store indoors.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not install equipment until ambient temperature and humidity conditions are maintained at levels indicated for final occupancy.

1.9 WARRANTY

A. Warranty: Manufacturer's standard form.

B. Warranty Period: Five years from date of Substantial Completion for Automated Material Handling System and Radio Frequency Identification Gates (RFID Gates)

PART 2 - PRODUCTS

2.1 AUTOMATED MATERIAL HANDLING SYSTEM (BOOK RETURN)

A. Manufacturers:

1. Sole Source Product: Lyngsoe Systems Inc. Exterior LibraryMate 2100 patron book returns.
   a. No Substitutions Permitted

B. Components:

1. RFID reading for library materials.
2. Exterior Shelf.
3. RFID access.
4. Receipt printing options for patrons- paper, email or SMS.
5. ErgoTrolley interface.
6. Three ErgoTrolleys.
7. Sorting/Check-in Operator Software Interface.

C. System Requirements:
   1. System check-in must be compatible with ISO 15693 18000-3 or ISO 28560-2 Radio Frequency identification tags.
   2. System must check items in at patron return in real time.
   3. System must communicate with libraries ILS system- via SIP2.
   4. System must be able to identify hold items and route them to appropriate sort location.
   5. System must cache items returned if check-in becomes disconnected from the ILS and process all check-ins automatically when connection is reestablished.
   6. System must be capable of processing 2400 items per hour.
   7. System must operate at 120vac 60hz.
   8. System must be modular and expandable.

2.2 RADIO FREQUENCY IDENTIFICATION GATES

A. Manufacturer:

   1. Sole Source Manufacturer: Envision Ware.
      a. RFID-GATE 3D-WA-U 3-Wide Aisle- transparent rfid gates with radar people counter - extra wide aisle width.
      b. EBM-SLE SW envisionware branch manager (ebm) - small library edition.

   2. No Substitutions Permitted.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, where equipment is to be located, with Installer present, for compliance with installation tolerances, substrate preparation, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected and surfaces are ready.

3.3 PREPARATION

A. Comply with manufacturer's written installation instructions.

3.4 INSTALLATION

A. General: Install equipment to comply with manufacturer's written instructions.

B. Proceed with installation only after coordination with existing conditions and new work is complete and any revisions, if necessary, to the work have been made to accommodate the system.

3.5 PROTECTION

A. Protect equipment from breakage and contaminating substances resulting from construction operations.

B. Maintain environmental conditions that will prevent equipment from being exposed to moisture from condensation or other sources for continuous periods of time.

END OF SECTION 11 51 00

SECTION 12 24 13 - ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Work Included: The Work of this Section includes, but is not limited to the following:

1. Roller shades manually operated.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 SUBMITTALS

A. Product Data: For each type of product indicated, include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions.

B. Shop Drawings: Submit detailed shop drawings showing location and extent of roller shades. Include elevations, sections, details, and dimensions not shown in Product Data. Show installation details, mountings, attachments to other work, operational clearances, and relationship to adjoining work.

C. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

1. Ceiling suspension system members and attachment to building structure.
2. Ceiling-mounted or penetrating items including light fixtures, air outlets and inlets, speakers, sprinklers, recessed shades, and special moldings at walls, column penetrations, and other junctures of acoustical ceilings with adjoining construction.
3. Shade mounting assembly and attachment.
4. Minimum Drawing Scale: 1/4 inch = 1 foot.

D. Samples for Verification:

1. Shade Material: Not less than 12-inch- square section of fabric, from dye lot used for the Work, with specified treatments applied. Show complete pattern repeat. Mark top and face of material.

E. Product Certificates: For each type of roller shade, signed by product manufacturer.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of roller shade.

G. Maintenance Data: For roller shades to include in maintenance manuals. Include the following:

1. Methods for maintaining roller shades and finishes.
2. Precautions about cleaning materials and methods that could be detrimental to fabrics, finishes, and performance.
3. Operating hardware.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Installer Qualifications: Installer must have technical qualifications, experience, trained personnel, and facilities to install specified items.

C. Source Limitations: Obtain roller shades through one source from a single manufacturer.

D. Fire-Test-Response Characteristics: Provide roller shade band materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL.

1. Flame-Resistance Ratings: Passes NFPA 701.

E. Product Standard: Provide roller shades complying with WCMA A 100.1.

F. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in factory packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same designations indicated on Drawings and in a window treatment schedule.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not install roller shades until construction and wet and dirty finish work in spaces, including painting, is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate

measurements on Shop Drawings. Allow clearances for operable glazed units' operation hardware throughout the entire operating range. Notify Commissioner of discrepancies. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 ROLLER SHADES

A. Single Roller Shades, General: Single shade system must consist of single roller, single fabric-type system, each fashioned with one of the shade fabrics described below.

B. Basis of Design Product: Subject to compliance with requirements, provide Mechoshade 5 System as maufactured by MechoShade Systems, Inc., or comparable product by one of the following:

1. Draper Inc.
2. Hunter Douglas, Inc.
3. Or approved equal.

C. Type: Single Solar Shade Assembly.

D. Operation: Manual, chain operated.

E. Shade Fabrics:

1. Solar Shade: ASTM D 1925; vinyl-coated polyester yarn. Shade fabric must be free from defects including, but not limited to, runs, tears, and warp and weft not perpendicular to each other. Fabric must comply with flame retardance local requirements.

2. Basis of Design: Subject to compliance with requirements, provide EcoVeil Series, as manufactured by MechoShade Systems, Inc., or comparable product by one of the following:

a. Draper Inc.
b. Hunter Douglas, Inc.
c. Or approved equal.

3. Openness Factor: 5%.

4. Color/Style: 1369, Silver Birch.

F. Rollers: 6063-T6 Extruded-aluminum tube of diameter and wall thickness required to support and fit internal components of operating system and the weight and width of shade band material without sagging; designed to be easily removable from support brackets; with removable spline fitting integral channel in tube for attaching shade material. Provide capacity for two roller shade band(s) per roller, unless otherwise indicated.

1. Direction of Roll: As indicated on the Drawings.

G. Mounting Brackets: 1/8" thick galvanized or zinc-plated steel sheet; wall jamb or ceiling mounted as indicated. Provide center support brackets as required to span or weight loads.

H. Bottom Bar: Steel or extruded aluminum, with capped ends. Provide exposed aluminum bottom bar with matching finials as required for smooth, properly balanced shade operation.

1. Color: Coordinate with shade color.

I. Mounting: Between jambs, or as indicated on the Drawings; permitting easy removal and replacement without damaging roller shade or adjacent surfaces and finishes.

J. Shade Operation: Manual roller shades must be equipped with continuous loop bead chain, clutch, and cord tensioner and bracket lift operator.

1. Position of Operator: As indicated on the Drawings.
2. Clutch: Capacity to lift size and weight of shade; sized to fit roller or provide adaptor.
3. Lift-Assist Mechanism: Manufacturer's standard spring assist for balancing roller shade weight and lifting heavy roller shades.
4. Loop Length: Length required to make operation convenient from floor level, or as indicated on the Drawings.
5. Bead Chain: Stainless steel.
6. Operating Function: Stop and hold shade at any position in ascending or descending travel.

2.2 ROLLER SHADE FABRICATION

A. Product Description: Roller shade consisting of a roller, a means of supporting the roller, a flexible sheet or band of material carried by the roller, a means of attaching the material to the roller, a bottom bar, and an operating mechanism that lifts and lowers the shade.

B. Concealed Components: Noncorrodible or corrosion-resistant-coated materials.

C. Installation Brackets: Designed for easy removal and reinstallation of shade, for supporting headbox, roller, and operating hardware and for hardware position and shade mounting method indicated.

D. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to shade hardware and adjoining construction; type designed for securing to supporting substrate; and supporting shades and accessories under conditions of normal use.

E. Color-Coated Finish: For metal components exposed to view, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 ROLLER SHADE INSTALLATION

A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions and located so shade band is not closer than 2 inches to interior face of glass. Allow clearances for window operation hardware.

3.4 ADJUSTING

A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.5 CLEANING AND PROTECTION

A. Clean roller shade surfaces after installation, according to manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.

C. Replace damaged roller shades that cannot be repaired, in a manner approved by Commissioner, before time of Substantial Completion.

END OF SECTION 12 24 13

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 12 36 00 - COUNTERTOPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Plastic-laminate-clad countertops.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.

B. Sustainable Design Submittals:

1. Environmental Product Declaration (EPD): For each product.
2. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.
3. Laboratory Test Reports: For composite wood products, indicating compliance with requirements for low-emitting materials.

C. Shop Drawings: For plastic-laminate-clad countertops.

1. Include plans, sections, details, and attachments to other work. Detail fabrication and installation, including field joints.
2. Show locations and sizes of cutouts and holes for items installed in plastic-laminate-clad countertops.
3. Apply AWI Quality Certification Program label to Shop Drawings.

D. Samples: Linoleum in each color required in manufacturer's standard size.

E. Samples for Verification: As follows:

1. Linoleum: For each color required, 12 by 12 inches in size.

2. Fabrication Sample: For each type and profile of countertop required, provide one sample applied to core material with specified solid wood edge material applied to one edge, include one corner piece demonstrating wood joining method. Finish solid wood edging with specified wood finish.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and fabricator.

B. Product Certificates: For the following:

1. Composite wood products.
2. High-pressure decorative laminate.
3. Chemical-resistant, high-pressure decorative laminate.
4. Adhesives.

C. Quality Standard Compliance Certificates: AWI Quality Certification Program.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

1. Shop Certification: AWI's Quality Certification Program accredited participant.

C. Installer Qualifications: AWI's Quality Certification Program accredited participant.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver countertops only after casework and supports on which they will be installed have been completed in installation areas.

B. Store countertops in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

C. Keep surfaces of countertops covered with protective covering during handling and installation.

1.8 FIELD CONDITIONS

A. Environmental Limitations without Humidity Control: Do not deliver or install countertops until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.

B. Environmental Limitations with Humidity Control: Do not deliver or install countertops until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining

temperature between 60 and 90 deg F and relative humidity between 43 and 70 percent during the remainder of the construction period.

C. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

D. Established Dimensions: Where countertops are indicated to fit to other construction, establish dimensions for areas where countertops are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 LINOLEUM-CLAD COUNTERTOPS

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of plastic-laminate-clad countertops indicated for construction, finishes, installation, and other requirements.

1. Provide inspections of fabrication and installation together with labels and certificates from AWI certification program indicating that countertops comply with requirements of grades specified.

B. Grade: Premium.

C. Linoleum Sheet: ASTM F2034, Type I, linoleum sheet with backing.

1. Roll Size: In manufacturer's standard length, but not less than wide.
2. Thickness: To match Commissioner’s sample.
3. Color: To match Commissioner’s sample.

D. Basis of Design Product: Subject to compliance with requirements, provide linoleum sheet material as manufactured by Forbo, or comparable product by one of the following:

1. Armstrong World Industries.
2. Johnsonite.
3. Or approved equal.

E. MDF Edge Treatment: Lumber edge for transparent finish matching wood species and cut of Commissioner’s sample.

F. Core Material: Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 130.

1. Finished Face Texture: Smooth.
2. Core Thickness: ¾ inch unless otherwise indicated.

2.2 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard unless otherwise indicated.

1. Wood Moisture Content: 5 to 10 percent.

B. Fire-Retardant Fiberboard: MDF panels complying with ANSI A208.2, made from softwood fibers, synthetic resins, and fire-retardant chemicals mixed together at time of panel manufacture to achieve flame-spread index of 25 or less and smoke-developed index of 200 or less in accordance with ASTM E84.

2.3 COUNTERTOP SUPPORT BRACKETS

A. Description: For built-in counters, surface- mounted and inside- wall brackets made manufacturers standard cold rolled steel, with holes for wall mounting and fastening to countertop.

1. Model # and Size: As indicated in Section 05 50 00 Metal Fabrications, to suit project application. 16 inches by 16 inches.
2. Weight Capacity: As indicated or required to suit project application.
3. Finish: Black and white as scheduled.
4. Mounting Hardware: #14 x 2-1/2-inch Phillips flat-head screw with color-matched finish washer, unless otherwise required to suit project application

2.4 MISCELLANEOUS MATERIALS

A. Adhesive for Bonding Linoleum: As selected by fabricator to comply with requirements.

B. Installation Adhesive:

1. Adhesives must have a VOC content of 70 g/L or less.
2. Adhesive must comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.5 FABRICATION

A. Sand wood lightly to remove raised grain on exposed surfaces before fabrication.

B. Fabricate countertops to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:

1. Solid-Wood (Lumber) Members: 1/16 inch unless otherwise indicated.

C. Complete fabrication, including assembly, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

1. Notify Commissioner seven days in advance of the dates and times countertop fabrication will be complete.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Before installation, condition countertops to average prevailing humidity conditions in installation areas.

B. Before installing countertops, examine shop-fabricated work for completion and complete work as required, including removal of packing.

3.3 INSTALLATION

A. Grade: Install countertops to comply with same grade as item to be installed.

B. Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.

1. Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
2. Seal edges of cutouts by saturating with varnish.

C. Field Jointing: Where possible, make in the same manner as shop jointing, using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.

1. Secure field joints in countertops with concealed clamping devices located within 6 inches of front and back edges and at intervals not exceeding 24 inches. Tighten in accordance with manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.

D. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Countertop Installation: Anchor securely with brackets in compliance with approved Shop Drawings and according to bracket manufacturer’s written instructions.

1. Install countertops level and true in line. Use concealed shims as required to maintain not more than a 1/8-inch-in-96-inches variation from a straight, level plane.

3.4 ADJUSTING AND CLEANING

A. Repair damaged and defective countertops, where possible, to eliminate functional and visual defects. Where not possible to repair, replace countertops. Adjust joinery for uniform appearance.

B. Clean countertops on exposed and semiexposed surfaces.

C. Protection: Provide Kraft paper or other suitable covering over countertop surfaces, taped to underside of countertop at a minimum of 48 inches o.c. Remove protection at Substantial Completion.

END OF SECTION 12 36 00

SECTION 12 48 13.13 - ENTRANCE FLOOR MATS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Resilient entrance mats.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:

1. Items penetrating floor mats, including air grilles.

C. Samples: For each exposed product and for each color and texture specified.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

PART 2 - PRODUCTS

2.1 ENTRANCE FLOOR MATS, GENERAL

A. Accessibility Standard: Comply with applicable provisions in ICC A117.1-2009.

2.2 RESILIENT ENTRANCE MATS

A. Basis of Design Product: Subject to compliance with requirements, provide Nomad Heavy Duty Scraper 8100 as manufactured by 3M, or comparable product by one of the following:

1. American Floor Mats.
2. Construction Specialties, Inc.
3. Or approved equal.

B. Vinyl Mats: 1/2-inch- thick mats; with beveled edges for surface applications and is an unbacked, non-woven, open and porous floor matting made from continuous vinyl filaments bonded together.

1. Color: Gray.
2. Mat Size: As indicated.
3. Perimeter: Heat embossed edging on all sides.

2.3 FABRICATION

A. Floor Mats: Shop fabricate units to greatest extent possible in sizes indicated. Unless otherwise indicated, provide single unit for each mat installation; do not exceed manufacturer's recommended maximum sizes for units that are removed for maintenance and cleaning. Where joints in mats are necessary, space symmetrically and away from normal traffic lanes. Miter corner joints in framing elements with hairline joints or provide prefabricated corner units without joints.

B. Coat concealed surfaces of aluminum frames that contact cementitious material with manufacturer's standard protective coating.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Install surface-type units to comply with manufacturer's written instructions; coordinate with entrance locations and traffic patterns.

3.3 PROTECTION

A. Maintain protection until construction traffic has ended and Project is near Substantial Completion.

END OF SECTION 12 48 13.13

SECTION 142400 – HYDRAULIC ELEVATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. All equipment, and labor required to complete as per the contract documents, the design, fabrication, installation and testing of one (1) holeless hydraulic elevator.
2. Provide all required staging, protection, hoisting and equipment necessary for installation.

B. Related Sections:

1. Section 03 30 00: Cast-in-Place Concrete
2. Section 05 12 00: Structural Steel Framing
3. Section 09 21 16: Gypsum Board Shaft Wall Assemblies
4. Division 23: Ventilation of hoistway and machine room
5. Division 26: Power feeders terminating at elevator control panel through fused main line switches, Branch circuits through lockable, fused disconnects for car lights, Lights and GFCI receptacles in machine room and pit.
6. Division 27: Telephone communication wiring to a junction box in the machine room, Card reader and CCTV systems, device and their interface with the elevator.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 "Submittal Procedures."

1.4 SUBMITTALS

A. Product Data: Include product data for safety features, operating system descriptions, sequence of operations, and equipment lists.

B. Shop Drawings:

1. Provide electronic copies of shop drawings showing scaled hoistway, machine room, entrances, cabs and fixture plans, elevations, sections and details. Include details in 2D CADD format.

a. Include reactions, heat emissions, and location of operating devices on layouts. Power Confirmation Sheets: Include hp (kw), code letter, accelerating current, full-load running current, demand factor and regenerative loads for applicable motors and power conversion units.

C. Finish Samples

1. Provide the following:

a. Minimum of two (2) 4 inch square samples of exposed material, including metal finishes, cab interior panels and sill finishes.
b. Submit samples of all fixtures including one of each type of car lantern, hall pushbutton station, and car and hall braille plates.
c. Samples must be labeled with project name and description of sample.

D. Product Data: Include product data for safety features, operating system descriptions, sequence of operations, and equipment lists.

E. Operations and Maintenance Data: Include operations, lubrication schedules and recommended lubricants, maintenance routines, and parts manuals in both hard copy and electronic version. Include straight-line, indexed, wiring diagrams of installed elevator circuits.

F. Final Acceptance Certificates and Operating Certificates for each elevator signed by a NYC Licensed Elevator Director or registered design professional acknowledging that elevators are accepted for normal unrestricted use.

G. Keys: Five sets of properly tagged keys to operate all keyed switches must be furnished upon final acceptance.

1.5 QUALTY ASSURANCE

A. Refer to DDC General Conditions Section 014000 “Quality Requirements.”

B. Installer with Special Experience:

1. Installer Qualifications: An entity meeting the requirements of DDC General Conditions Section 014000 1.7/C1.

C. Installer must be capable of providing maintenance service, including adequate local parts inventory located within proximity of the installation.

D. Installer must be capable of providing 24-hour-a-day emergency service and respond to trouble calls within 1-1/2 to 2 hours during the 1 year guarantee period.

1.6 DEFINITIONS

A. The definitions contained in ASME A17.1/B44 apply to this work.

1.7 APPLICABLE CODES, STANDARDS, AND PUBLICATIONS

A. Latest version of ASME A17.1/CSA B44 and ASME A17.2/CSA B44 adopted by the New York City Department of Buildings, and New York City Elevator Code 2022.

B. New York City Building Code, Appendix K.

C. 2016 NYC Energy Code

D. Life Safety Code, NFPA 101, and CCR Title 19.

E. Specifications and references in this Section do not supplant any code requirements governing the design, fabrication, installation or operation of the equipment.

F. In case of any conflict in applicable codes, regulations or standards, the more stringent requirement must take precedent.

G. The elevator supplier must be licensed per requirements of the New York City Department of Buildings.

1.8 MANUFACTURER'S WARRANTY

A. Provide a written warranty guaranteeing the equipment installed under these specifications against defects in material and quality of installation and correct any defects not due to ordinary wear and tear or improper use for a period one (1) year from the date of substantial completion.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle materials, components, and equipment in manufacturer's protective packaging.

B. Store materials, components, and equipment off of ground, under cover, and in a dry location.

C. Handle material to prevent damage to edges, surfaces and finishes. Damaged material must be replaced by elevator manufacturer prior to installation.

1.10 COORDINATION

A. Coordinate installation of elevator equipment including items that are embedded in concrete. Furnish templates, sleeves, and installation instructions and deliver to Project site in time for installation.

B. Coordinate locations and dimensions of other work relating to electrical service and outlets, lights, security interface cabinets, switches and communication lines to machine rooms.

PART 2 – PRODUCTS

2.1 SUMMARY – HYDRAULIC ELEVATORS

A. Passenger Elevator

1. Quantity: One

2. Nomenclature: No. 1
3. Type: Single Deck Passenger
4. Capacity: 2,100 Pounds
5. Speed: 125 FPM
6. Operation: Selective Collective
   a. Special Features: Car and/or Hall button Security Interface

7. Machine: Type 1
8. Jack: 3-stage twin-post holeless hydraulic
9. Machine Room: + 9’ 0” remote at Level B.
10. Stops: 3 Front / 1 Rear
11. Floors Served: BF, BR, 1, M
12. Control: Electronic Soft Start
13. Power Supply: 208 V, 3 Phase, 60 Hertz
14. Car:
    a. Platform: 6' 0” wide x 5' 8-1/4" deep x 7' 6" high (to car canopy)
    b. Interior: 5' 8" wide x 4' 5" deep x 7' 2" high (to car dropped ceiling)
    c. ADA Accessibility
    d. Load Class: A
    e. Cab Enclosure: Type 1
    f. Architectural Metal Finish: Finish: Type 1
    g. Sills: Aluminum
    h. Flooring: Type 1 by other trades- allow 5/8 “ and 75 #

15. Passenger Entrances:
    a. Type: 1-Speed, Side-Opening
    b. Size: 3’ 0” wide x 6’ 8” high
    c. Finish/Construction: Baked Enamel doors and frames, Construction Type 1
    d. Braille Plates: Type 1
    e. Sills: Aluminum
    f. Sill Support: Type 1

16. Signal Fixtures:
    a. Car Operating Panel: Provide two Type 1 operating panels
    b. Car Position Indicator: Provide a Type 1 position indicator in each car operating panel.
    c. Provide all vandal proof fixtures
    d. Traditional 2-Button Dispatch Fixtures

        i. Hall Push Button Stations: Provide one per floor for normal dispatching.
        ii. Car Traveling Lanterns. Type 2.
        iii. Hall Position Indicator: Provide 1” high Dot Matrix or LED Position Indicator at all landings. Locate HPI in hall push-button faceplate.

17. Life Safety:
    a. Phase I & II Firefighters Operation
    b. Cab emergency lighting: Type 1
    c. Voice Communication: Type 3

d. Cab Video: CCTV pinhole for camera, provide RG6-U coaxial trail cables, dedicated single-phase AC outlet on car-top and interface box.
e. Automatic battery lowering.

18. Door Operation: Type 1
19. Door Protection: Infrared proximity detectors; variable timing and nudging
20. Guides: Type 2
21. Buffers: Spring return with blocking as required
    a. Auxiliary Operations: Independent Service

B. Elevator Equipment Manufacturers:
1. Basis-of-Design Product: Subject to compliance with requirements, provide equipment by Minnesota Elevator Industries (MEI) or comparable products by one of the following:
    a. Canton Elevator,
    b. Mongrain Vertical Transport,
    c. Or approved equal.

C. Elevator Cab & Entrance manufacturers: Subject to compliance with the requirements, provide products by one of the following:
1. Minnesota Elevator Industries (MEI)
2. Canton Elevator,
3. Mongrain Vertical Transport,
4. CEC, EDI/ECI,
5. National Cab & Door,
6. Regency Elevator Products
7. Or approved equal.

D. Control Manufacturers: Subject to compliance with the requirements, provide products by one of the following:
1. GAL Galaxy,
2. MCE,
3. Smartrise,
4. ECI,
5. Or approved equal.

2.2 MATERIALS AND FINISHES

A. Steel: Low carbon, cold rolled to stretcher leveled standard flatness per ASTM A366 for sheet, ASTM A36 for structural.

B. Stainless Steel: Type 304 with No. 4 brushed directional finish on exposed surfaces per ASTM A167, as specified and indicated on the architectural drawings. Grain of belting in direction of longest dimension or as indicated on the contract drawings.

C. Bronze: 60/40 muntz metal.

D. Aluminum: Extrusions per ASTM B221; sheet and plate per ASTM B209.

E. Paint: All exposed metal work furnished under this section, except as otherwise noted, must be cleaned of oil, grease, scale and other foreign matter and factory painted 1 shop coat of Manufacturer's standard rust-resistant primer. After erection, provide one finish coat of industrial enamel paint. Galvanized finishes in the hoistway or the machine room need not be painted. Field paint and touch up any ferrous metal that is exposed or welded during construction or installation.

1. Prime Finish: Clean all surfaces receiving a baked enamel finish of oil, grease, scale, etc. Apply one coat of rust-resistant mineral paint followed by a filler coat over uneven surfaces. Sand smooth and apply final coat of mineral paint.
2. Baked Enamel: Prime per 1. above. Apply and bake three additional coats of enamel in the solid color and finish as selected by the Commissioner.

F. Architectural Metal Finishes: As per contract drawings and specifications, or in their absence, as per below.

1. Type 1: 304 Satin stainless #4 long grain, ASTM A240 type 304.
2. Type 2: Mirror stainless steel #8 mirror finish ASTM A240 type 302.

2.3 OPERATION

A. Operational Control: Systems specified hereafter must be provided for each elevator/group per Article 2.1.

1. Microprocessor-Based, Selective Collective Control:
   a. Control of the elevator must be automatic by means of momentary, illuminated push buttons in the car corresponding to floors served, and by matching push buttons in the hall corresponding to available travel direction.
   b. Momentary pressing of hall buttons must dispatch the car to the designated landings in the order in which the landings are reached by the car, irrespective of the sequence in which the buttons are pressed. The push button must remain illuminated until the car answers the call.
   c. When the car direction has been established, it must stop at all floors with calls in that same direction. The car must not stop for opposite direction hall calls, unless the stop for that floor has been registered by a car call.
   d. When the car has responded to its highest or lowest call, and stops are registered for the opposite direction, its direction of travel must reverse automatically and it must then answer the car and hall calls registered for that direction.
   e. If both up and down calls are registered at an intermediate floor, only the call corresponding to the direction of car travel must be canceled upon the stopping of the car at the landing.
   f. A car that is stopping for the last hall call in the established direction and that hall call is for the opposite direction with no onward car calls, then the car must reverse direction and proceed.

g. Door opening standing times must be adjustable between car calls and hall calls.

2. Additional Features of All Controls:

a. Auxiliary Dispatching: A backup dispatch system must be provided should the car selection or dispatching system fail. The cars must leave the dispatching terminals without regard to sequence or regular intervals and proceed to answer registered calls in normal sequence and manner (not if firefighter's return features have been activated).

b. Provide all necessary accessible and life safety functions including:

i. Accessibility Operations in compliance with USDOJ'S 2010 ADA Standards for Accessible Design and ICC A117.1-2009.

ii. Emergency Recall Return to Main and Alternate Landing per New York City Construction code requirements.

c. Low Oil Control: If the oil level becomes too low for travel to the top floor, provide controls to return elevator to the main level and park until oil is added.

d. Viscosity Control: Provide oil thermal unit to maintain oil at operating temperature.

e. Stopping Accuracy: An automatic two-way stopping and leveling device must be provided, designed to govern the stopping accuracy of the car to within ±1/4" above or below the landing sill. This operation must be effective to avoid overtravel, as well as undertravel, of the car and maintain the stopping accuracy regardless of the load in the car, direction of travel, rope slippage or stretch.

f. Energy Savings Feature: de-energize cab lighting and fan when elevator is unoccupied, stationary at floor level with doors closed and inactive for fifteen (15) minutes or longer.

g. Independent Service: Provide controls for operation of each elevator from car buttons only. Under this operation door closing must be initiated by activating the desired destination floor button or the door close button.

B. Special Features, provide as scheduled in Article 2.1:

1. Security System Interface

a. Where car and/or hall button security interface is scheduled in Article 2.1, provide an interface box in the machine room, all required traveling cables and car fixture provisions for a proximity type card reader system. Interface box will include labeled terminal strips and necessary relays for interface with the security system.

b. Provide software interface with building system security system as scheduled in Article 2.1.

c. All Security Systems must be arranged so that firefighters' operation controls override floor security blockouts.

C. Door Operation: Doors must open automatically when the car arrives at a floor to permit the transfer of passengers. Doors must dwell open for an adjustable period of time before closing. Equip the car doors with pre-opening circuits so that the doors are capable of initiating door

open as the elevator is level at the landing.

1. Provide selective door operations for elevators equipped with front and rear openings.
2. When required in Article 2.1, include an extended door hold open button in the service elevators' main car operating panel to extend the door hold open time for cart transfers. Extended door open time to be adjustable from 10-20 seconds; adjustment must be available from the Elevator Monitoring System. Registration of a car call must cancel the hold open time.

D. Motion Control: AC type with valve suitable for operation specified and capable of providing smooth, comfortable car acceleration and deceleration. The difference is car speed between full load and no load will be not more than ±10% of the contract speed when traveling in the up- or down-direction.

E. Emergency Features:

1. Emergency Recall (Phase I) and Firefighters' Service (Phase II): Equip all elevators with control system to recall (Phase I) the cars during a fire or other emergency condition, and Firefighters' features and functions to operate per code (Phase II), per ASME A17.1. Provide terminals on the controller for connection of signal from sensors provided in other sections of the work. Operation must be similar on all elevators and visual/audible signal must operate until return is complete or automatic operation restored. Provide the designated main and alternate return level sequencing per the New York City Fire Department.
2. Emergency Cab Lighting, Ventilation and Emergency Alarm Unit: Rechargeable nickel cadmium, lead acid, or gel-cell type battery to provide a minimum of four (4) hours of operation in emergency situations. Mount the emergency alarm bell on each car top. Locate an emergency lighting test button in the car service panel. A main line power failure or pressing the test button must illuminate the emergency lighting.

    a. Type 1: Locate a separate lighting unit with two fixtures in the main car operating panel.
    b. Type 2: Provide a battery pack with trickle-charger to illuminate two of the normal cab lighting fixtures for emergency lighting.

3. When scheduled in Article 2.1, provide Battery Lowering operation as follows: upon loss of normal power, standby power source must be provided via 12-volt D.C. battery unit installed in machine room, including solid-state charger and testing means mounted in a common metal container. Battery to be rechargeable lead acid or nickel cadmium with a ten-year life expectancy. Standby power source must provide a minimum of four (4) hours of operation.

2.4 MACHINE ROOM EQUIPMENT

A. Arrange equipment in machine rooms. Provide identifying numbers on power-unit, controller, and main line and auxiliary disconnect switch(s).

B. Pump Unit: Assembled unit consisting of positive displacement pump, induction motor, master-type control valves combining safety features, holding, direction, bypass, stopping, manual lowering functions, viscosity control unit, shut-off valve, oil reservoir, with protected vent opening, oil level gauge, outlet strainer, drip pan, muffler, all mounted on isolating pads.

1. Type 1: submersible unit located within oil reservoir. Design for 80 up starts/hour.
2. Type 2: dry unit located below oil reservoir. Enclose entire unit with removable sheet steel panels lined with sound absorbing material. Design for 80 Up starts/hour.

C. Hydraulic Power Unit Isolation:

1. 2.75” x 3.5” x 1.40” composite vibration isolation pad consisting of: 5mm green and 26mm black isolation pads separated and bonded to a galvanized 0.188” steel bearing plate, includes isolated anchor washers for Power unit system weight range: 1,000 - 2,200 lbs.
2. 3.5” x 6” x 1.40” composite vibration isolation pad consisting of: 5mm green and 26mm black isolation pads separated and bonded to a galvanized 0.188” steel bearing plate, includes isolated anchor washers for Power unit system weight range: 2,300 - 4000 lbs.
3. Multi-Density vibration isolation pad set includes: 2.75” x 3” x 1” green corner isolation pads with isolated anchor washers and a 14” x 19.69” x 1” black under-motor isolation pad for Power unit systems weight range: 1,200 - 2,500 lbs, for OEM submersible power units with motor mounted on the flat bottom floor supported tanks.
4. Isolation pad with a vertical natural frequency of 15Hz or lower over the specified load range.
5. Isolation pad deflection between 3mm-6mm over the specified load range.
6. Sole Source Product: C.E. Electronics – Acoustics Group: CQuiet Hydraulic Power Unit Isolation.

    a. No Substitutions Permitted.

D. Noise Shield: airborne sound barrier at wall behind hydraulic power unit providing:

1. Fire Rating: Flame Spread Index (FSI) 12.6 / Smoke Development Index (SDI) 19.6 per ASTM E84 or equivalent test method.
2. Sound Rating: Sound Transmission Classification (STC) 29 with a rating of 18 @ 125 Hz per ASTM E90 & ASTM E413.
3. Composite material of bonded fiberglass to noise barrier with reinforced foil facing with a nominal density of 2 lb./cu. ft. and nominal thickness 1”.
4. Sole Source Product: C.E. Electronics – Acoustics Group: CQuiet Hydro Noise Shield.

    a. No Substitutions Permitted.

E. Controller: Cabinet type with hinged doors and adequate ventilation fans to dissipate heat. Mount cabinet to comply with code required working clearances. Wiring must be to terminals with permanent labeling. Labeling must match wiring diagrams. Provide the proper ampere rating marked adjacent to all fuse holders. Each controller must be equipped with plug

compatible diagnostic ports, system monitoring ports, and remote LCD drivers and plugs. Provide controllers with modem and data card for the remote monitoring connections.

F. Muffler: Provide in discharge oil line near pump unit. Design must dampen and absorb pulsation and noise in the flow of hydraulic fluid.

G. Piping and Oil: Provide piping, connections and oil for the system. Buried piping must be secondarily contained with watertight schedule 40 PVC sleeves between the elevator machine room and pit. A minimum of two sound isolation couplings must be provided between the pump unit and oil line and the oil line and jack unit. Use sound isolation systems appropriate to piping installation as follows:

1. 360 Isolation Clamp: Vibration isolation of hydraulic pipe for standard 1 5/8" wide c-channel supports.
   a. Thermoplastic elastomer cushion with interlocking edges and channel legs to ensure cushion remains properly positioned in channel.
   b. Resistant to most fuels, oils, solvents and other harsh materials.
   c. Electro-galvanized steel clamp for corrosion resistance.
   d. Sole Source Product: C.E. Electronics – Acoustics Group: CQuiet 360 Pipe Isolation clamps.
      1) No Substitutions Permitted.

2. Pipe Stand Isolation Kit: Vibration isolation pad set for floor stand pipe supports.
   a. Green nitrile vibration isolation pads to isolate (1) stand base and (2) pipe wrap to isolate pipe from the stand and clamp, includes base anchor isolation washers. Universal fit for all floor stand base types, fitting pipe sizes up to 4".
   b. Sole Source Product: C.E. Electronics – Acoustics Group: CQuiet Hydraulic Pipe Stand Isolation Kit.
      1) No Substitutions Permitted.

3. Pipe Iso2 Hangers: Vibration isolation for ceiling supported hydraulic pipe.
   a. Vibration isolation hanger consisting of a one piece rectangular steel hanger box containing both a stable steel spring and a double deflection neoprene element having a minimum of 1.5" deflection.
   b. Stable steel spring; color coded to indicate capacity, having a minimum of 1" deflection with 50% additional travel from weighted load capacity to solid load.
   c. Allows a support rod misalignment through a 30° arc without metal-to-metal contact or other short circuit.
   d. Sole Source Product: C.E. Electronics – Acoustics Group: CQuiet Pipe Iso2 hangers.
      1) No Substitutions Permitted.

H. Shut-off Valve: Provide valve on line adjacent to pump unit. Provide second valve in pit adjacent to jack.

I. Security Interface Cabinet: When scheduled in Article 2.1, provide machine room interface cabinets with cross connects for all elevators equipped with security control.

J. Signage: Provide appropriate safety and code required signage and labeling.

K. Pressure Switch: Provide oil pressure sensitive switch in line to automatically close and prevent loss of oil in cylinder upon loss of pressure in oil supply line.

2.5 HOISTWAY EQUIPMENT

A. Guide Rails: Steel T-Section suitable for application of car size and capacity fastened to building structure with adjustable steel brackets. Provide inserts and/or embeds for fastening brackets to structure as needed based on the shaft construction. Provide double bracketing where feasible to meet bracket span where needed when additional bracket support steel is not shown on the structural drawings.

B. Buffers: Spring type with any blocking and supports when needed.

C. Hydraulic Jack Assembly:

1. Cylinders: Seamless steel pipe. Design head to receive unit type packing and provide means to collect oil at cylinder and return automatically to oil reservoir.
2. Plungers: Polished seamless steel tubing or pipe. If plunger length exceeds 24’-0”, provide two of more sections not exceeding 16’-0” in length. Join sections by internal threaded couplings. Multiple section jacks must be factory polished while assembled and marked for future reassembly. Isolate plungers for car frame.
3. Provide dual jack 3-stage hole-less type.

D. Jack Support: Provide steel pit channels to support jack assembly and transmit loads to building structure. Provide intermediate stabilizers as required.

E. Fluid Shut-Off Valves: Provide manual on/off valves in oil line adjacent to pump unit and jack unit in pit.

F. Landing System: Solid-state, magnetic, or optical type.

G. Normal and Final Terminal Stopping Devices: Per New York City Building Code.

H. Electrical Wiring: Solid or stranded copper throughout with individual wires coded and all connections on identified studs or terminal blocks. Use no splices or similar connections in wiring except at terminal blocks, control cabinets, or junction boxes. Provide 10% spare conductors throughout. Flexible conduit must not be used on flat portions of the car top.

I. Conduit & Duct: Conduit size must be ½" minimum. Flexible conduit on flat portions of the car top must not be used. Flexible heavy-duty service cord, Type SO, may be used between fixed car wiring and car door protection light matrix junction boxes. All duct work must be painted or galvanized steel and duct.

J. Traveling Cables must be provided with flame and moisture-resistant outer cover. Mount cables to prevent rubbing or chafing against hoistway or car items with a continuous vertical strip of wire cloth between the cables and hoistway items. Traveling cables exceeding 100' in length must be supported with steel internal messenger wires.

1. Provide each set of traveling cables with 10% spare conductors. For elevators with in car card readers include 20AWG 6 twisted pair. For all elevators include RG6U 2 pair (CCTV camera) and dedicated 120 VAC circuit run through 14AWG conductors in traveling cable.

K. Entrance Equipment, Horizontally Opening Doors:

1. Door Hangers: Provide polyurethane roller sheaves with up-thrust adjustments, two point suspension hangers and tracks for each horizontal sliding door; no metal-to-metal contact permitted.
2. Door Tracks: Drawn steel shapes, smooth surface and shaped to conform to the hanger sheaves. Tracks must be removable for replacement.
3. Interlocks: Provide an electromechanical switch containing electrical contacts, a keeper and an engagement mechanism. Provide fire-resistant wiring, NEC, Type SF-2 or equivalent.
4. Closers: Spring, spirator, or weighted type attached to the entrance struts (door mounted weights not acceptable).
5. Relating Cables: Provide between door panels when required by entrance type and door linkage, include stainless steel aircraft cord, swaged fasteners, sheaves and adjustment clips.

L. Floor Numbers: Provide painted 4" high fire floor numbers within the hoistway on back of hoistway door panels.

2.6 PASSENGER HOISTWAY ENTRANCES

A. Summary: Provide complete entrances with the clear dimensions, finishes and allowances indicated in equipment summaries in Article 2.1 bearing 1 ½ hour UL fire labels, or provide certificate showing "like labeled construction" for over-sized entrances.

1. For designated emergency car, provide "Star of Life" designation plates at height of 78"-84" above finished floor on both side jambs at all floors.
2. Provide sound-deadening mastic to the interior of side and head jamb frames.
3. For FSA Elevators, provide FSAE Symbol not less than 3" at height of 78"-84" above finished floor on both side jambs at all FSAE lobbies.

B. Frames: No. 14 U.S. gauge steel construction per equipment summaries in Article 2.1.

1. Type 1: Bolted construction with ¼" projection at head jamb.
2. Type 2: Welded construction with ¼" projection at head jamb.
3. Type 3: Flush welded head jamb. Painted frames must have no visible miter joint. Architectural metal frames must have a miter joint following the architectural drawings, or in the absence of such detail, must have vertical graining.
4. Type 4: construction per type 3 with flush transom, size per architectural drawings.

C. Braille Plates: All passenger elevators: Main egress landing plate must include a "Star" designation. Mount braille plates centered on jamb at 60" above finish floor. Provide per Article 2.1 schedule:

1. Type 1: Manufacturer's standard applied plate with adhesive mounting. Black plate with white or stainless steel type finish for raised numeral.
2. Type 2: Flush rear-mounted cast plates in brushed zinc or as approved by the Commissioner.

D. Door Panels: No. 16 U.S. gauge steel with 2 removable, fire type gibs per panel. Doors with heights greater than 7'-0" must be constructed with interlocking stiffening ribs. Providing all door panels with top and bottom fire safety retainer clips that mesh with the entrance jambs when in the closed position. Provide access drop-key hole at all landings (except terminal landings with keyed hoistway access) with a matching ferrule for architectural metal finish doors, and black plastic ferrule for paint grade doors. Center-parting doors must have an interlocking male/female rubber astragal full height of door panel. Construct sight guards of same material and finish to match door panels.

E. Sill: Extruded or formed as scheduled in Article 2.1.

F. Sill Supports as scheduled in Article 2.1:

1. Type 1, Groutless style: 10 gauge bent or formed galvanized steel sill support channel full width of hoistway. Support and fasten to building structure at floor slab at minimum of 3 points within clear opening with ½" wedge anchors or equivalent weldment. Provide 10 gauge galvanized steel vertical support channels for continuous support of sills and headers. Fasten vertical channels to building structure at floors slabs with ½" wedge anchors or equivalent weldment. Securely support bottom landing vertical channels on pit floor or with steel angle support as described in paragraph b. below. Provide a 20 gauge galvanized steel grout stop plate full width of hoistway beneath leading edge of sill support channel.
2. Type 2, Steel Angle Sill Support: 4" x 3/8" x 3/8" (single speed) or 5" x 3/8" x 3/8" (two speed) steel angle full width of hoistway fastened to building structure 12" O.C. with ½" wedge anchors or equivalent weldment.
3. Type 3, Concrete haunch: 2 ½" deep by minimum 10" length depression full width of hoistway to accept sill, by other trades. Use adjustable knee brackets or jack-bolts to level sill.

G. Fascia, Toe Guards, and Hanger Covers: No. 14 U.S. gauge furniture steel with Manufacturer's standard finish.

H. Struts and Headers: Provide formed steel struts of sufficient size and stiffness to support the formed steel entrance header. Provide door open rubber bumpers on each entrance support strut.

I. Provide interlocks on single blind hoistway (express run) access doors when and as needed.

J. Hoistway Access: Rear mounted key switches in entrance jambs at top terminal landings and at bottom terminal landings when there is no walk-in pit.

2.7 MOVING HOISTWAY EQUIPMENT

A. Car Frame: Welded or bolted steel channel construction.

B. Platform: Isolated type, structural elements constructed entirely of steel, securely welded together; surface faced with two layers of 3/4" marine grade plywood. Loading classification as scheduled per Article 2.1. Recess platform to receive finished floor per scheduled thickness.

C. Guide Shoes:

1. Type 1: Manufacturer's Standard;
2. Type 2: Roller Type - Provide guides with (3) spring-loaded rollers;

D. Floor Covering:

1. Type 1, Passenger Elevators: Flooring provided by other trades.

E. Car Sill-Passenger and Service Elevators: Narrow type as specified set at a height to be flush with the finished car flooring. Finish as scheduled in 2.1.

F. Toe Guard: Per New York City Building Code.

G. Car Door Hangers and Tracks: Conform to specification on hoistway entrance hangers and tracks. Equip doors with polyurethane-tired hanger hollers.

H. Header: Constructed of thick steel shaped with stiffening flanges, securely mounted and braced to the car top.

I. Car Door Clutches: Provide heavy-duty clutches, vanes, linkage arms, drive blocks and pickup rollers or cams to provide positive, smooth, quiet door operations capable of pre-door opening. The clutches must be designed with movable vanes to permit the car doors to be closed while the hoistway doors remain open at the floor for maintenance purposes. Provide car doors with restrictors per New York City Building Code.

J. Car Door Electrical Contact: Electrical contact to operate in conjunction with the car doors so that lift cannot operate unless doors are closed or within tolerance allowed by New York City Building Code.

K. Door Operator: Arrange operator so the car doors can be opened by hand from inside the car in case of power failure, if it is within the hoistway door unlocking zone.

1. Type 1 – Manufacturer's standard application for pre-engineered elevator.
2. Type 2 – High performance, high-speed, heavy-duty, ACV³F closed loop, door operator capable of opening doors at no less than 2.5fps and accomplishing reversal in no more than 2.5" of door movement.

L. Door Reopening and Control Devices:

1. Car Door Reversal Device: A solid-state electronically operated infrared door reversal, proximity device must be installed on the car doors. The device must contain specially designed electronic components enclosed in an insulated chassis. The device will create a criss-cross matrix of invisible, infrared, light beams, minimum 32 beams, which will scan the car doorway and will detect, through the breaking of any light beam, any opaque object that may be placed in its path.
2. After a car stop is made, the door must remain open for a predetermined interval before closing. If, while the door is closing, the matrix of invisible light beams is interrupted by a passenger or an object entering or leaving the car, the door must stop and reopen, after which the door must again start to close.
3. Door Open Timing Feature: Timing feature must operate in conjunction with door light ray matrix to provide adjustable, reduced, hold-open time once rays are broken and reestablished. In the event rays are broken beyond an adjustable time, a buzzer must sound and doors try to close at reduced speed.
4. Variable Timing Feature: Provide separately adjustable timers, to enable varying the time that the hoistway doors remain open after stopping in response to a car call or a landing call. The dwell time for a car call stop must be adjustable between one and five seconds and the timing for a landing call stop must be adjustable between three and eight seconds. If a stop is made in response to both a landing call and a car call, the timing of the landing call must predominate. In the event that the light beam is interrupted while the doors are opening or after the doors are fully open, the time that the doors remain open after the light beam has been reestablished must be reduced to an adjustable time between two and one second, depending upon whether a landing call or a car call predominated. This time must also be a minimum time that the doors remain open if the door protection beams are interrupted and reestablished before the door is fully open.

    a. Hall Call Door Dwell: 5.0 to 8.0 seconds.
    b. Car Call Door Dwell: 3.0 to 5.0 seconds

5. Nudging Action: In the event, a door protection light beam is continually obstructed, or the door hold open button is continually activated, for a predetermined time interval (20 to 30 seconds) after automatic door closing has been initiated, a buzzer must sound and the doors must be closed at a gentle, reduced speed. Timers must be individually adjustable.

M. Car Top Control Station: Provide stations per New York City Building Code.

N. Emergency Exits: Provide car top emergency access exits and contacts per New York City Building Code.

O. Work Light and Duplex Plug Receptacle: Provide on the top of the car. Provide lights with an on/off switch and wire or plastic bulb guards.

P. Provide KO box and opening behind card readers in car operating panel and car top camera.

2.8 CAR ENCLOSURES

A. Type 1 – Manufacturer's standard passenger car enclosure must have the following features:

1. Shell: Reinforced furniture steel side and rear walls with interlocking, stiffening ribs to eliminate oil-canning or warping such that a horizontal force of 100lbF applied over an area of 4 in.^{2} in the center of a cab panel will not deflect more than 1" nor cause permanent distortion. Finish cab shell with baked enamel finish. Shell base must contain ventilation cutouts in the side and rear walls. Apply sound-deadening mastic to car exterior.
2. Top: Reinforced U.S. 12 gauge furniture steel with hinged exit and baked enamel finish.
3. Front Return Panels and Integral Entrance Columns: Provide per architectural metal finish scheduled in Article 2.1 in manufacturer's standard arrangement.
4. Transom: U. S. 14 gauge per architectural metal finish scheduled in Article 2.1.
5. Car Door Panels: Same construction as hoistway door panels, interior finish must be per architectural metal finish scheduled in Article 2.1.
6. Interior Wall Panels: Manufacturer's standard selection of interior wall panel finishes in laminates and/or anodized metal finish.
7. Lighting and suspended ceiling: Manufacturer's standard suspended ceiling with high-efficiency LED lighting. Provide a minimum of 5 foot-candles of illumination at the car sill with doors closed. The sum of the lumens divided by the sum of the watts must not be less than 35 lumens per watt.
8. Ventilation: Car top mounted exhaust blower to provide 1.0x air exchanges per minute at high speed. The fan must not consume more than 0.33 watts/cfm at maximum speed. The blower must exhaust the cab air into the hoistway.
9. Pads: Three section removable, full-height quilted, fire-retardant protection pads for each elevator to cover walls and front returns with cutouts for access to car control station and service cabinet. The pads must extend from the car canopy to 1" above the floor.
10. CCTV Security Cameras: Provisions for CCTV security cameras (provided by security subcontractor) concealed in the elevator dropped ceilings. Provide shielded wire pairs or coaxial cables from each CCTV camera run to the elevator machine room junction boxes.

2.9 SIGNAL FIXTURES

A. Car Control Stations:

1. Type 1 – Applied Faceplate: Provide a car operating panel in US 14 gauge metal to match architectural metal finish scheduled in Article 2.1. Mount in enclosed back-box with tamper proof, matching screws.
2. Type 2 – Swing return panel: Provide car control stations without faceplate with US 14 gauge or equivalent composite CRS/architectural metal to match architectural metal finish scheduled in Article 2.1, consisting of a metal box containing the operating fixtures, and a lockable service panel mounted in the car front return panels. Swing entire panel on substantial concealed hinges. Panel must not sag in the open position and must have a positive stop to prevent it from contacting the adjacent cab wall or handrail. Provide a concealed 3-point locking mechanism.

B. The front return swing panels or applied faceplates must be engraved and filled with the identifying number of each elevator and its capacity in lbs. and number of permitted persons. The floor call buttons, alarm button, door open button, and emergency stop switch must be suitably identified by permanently applied, cast metal tactile symbols and markers per the approved shop drawings. All devices must be mounted per Accessibility Standard: USDOJ's 2010 ADA Standards for Accessible Design and ICC A117.1-2009. Engrave and fill CERTIFICATE OF INSPECTION ON FILE IN THE BUILDING OFFICE and NO SMOKING at the top of the return panels or faceplates in each car. The operating panel must contain the following controls and buttons:

C. Identify exposed floor buttons, door open and close buttons, alarm and emergency communication buttons with braille plates. Cast metal braille plates for must be set in cutouts flush to return or rear mounted style in brushed zinc or approved equal.

D. An illuminating alarm button must be provided at the bottom of each car station to ring a bell located in the hoistway near the main lobby and on top of the car.

E. Provide an illuminating hands-free communication call button. Actuating the communication call button must activate the Fire Command Center panel intercom distress signal. The call button light must flash for 10-20 seconds once the intercom call is answered (latching feature canceled).

F. A door open button, which must stop the closing motion of the doors and return them automatically to their fully open position. This button must be effective while the car is at a landing and until the car starts into motion, regardless of any special operational features (except firefighters' service).

G. Security card reader provisions (reader provided by other trades).

H. Provide an emergency pull-to-stop switch as required by New York City Elevator Code.

I. A service panel with a heavy-duty, vandal-resistant, hinged, lockable, door matching the front return panel finishes or faceplates must be mounted below the main car operating station. The service panel must contain the following controls with each control and its operating positions identified by engraved and black filled letters:

1. An inspection service switch for disconnecting all automatic operation, limiting the car speed, and making the appropriate hoistway access switch operable, when the car is at the top or bottom terminal, conforming to the ASME A17.1 Code.
2. A car light on and off switch.
3. An emergency car lighting "test" button to activate the car emergency lights.
4. A 3 or (off, low, high speeds) car exhaust blower switch.
5. An independent service key switch.
6. A convenience electrical duplex outlet.

J. Include voice synthesizer in car to announce arrival floor and direction of travel.

K. Traditional 2-button dispatch hall pushbuttons: Provide the elevator groups with pushbutton risers as specified in equipment summaries Article 2.1, flush mounted with faceplates matching architectural metal finish scheduled in Article 2.1. Each fixture must include pushbuttons for each direction of travel, which illuminate in white LED to indicate call registration.

L. Car Position Indicators: where faceplates are used, provide matching cover-plates with tamperproof screws.

1. Color LCD or TFT programmable type, 4" display

M. Car Directional Lanterns: Provide direction signals illuminating white for up and red for down mounted in each car entrance (strike and return) jamb. Signal must illuminate indicating direction of travel and chime sound (once for up direction, twice for down direction).

1. Type 1: Provide manufacturer's car direction lanterns with faceplate to match architectural metal finish specified in Article 2.1, mount with tamperproof screws.
2. Type 2: Provide as specified for type 1 with flush vandal-proof lens design.

2.10 HOISTWAY ACCESS DEVICES

A. Hoistway Access Switches: Mount without faceplates in door jamb at all top floors and bottom floors where walk-in pits are not provided.

2.11 SIGNAGE

A. Provide all New Yor City Construction Code required signage related to the elevators including "In case of fire…" lettering etched on hall push button station faceplates, Phase I & II instructions, machine room and pit entry door signage, and machine room, hoistway and pit safety signs. Provide aluminum or cast "Star of Life" designations on entrance jambs as required.

2.12 COMMUNICATION SYSTEMS

A. Type 1: Hands-free Autodial telephone.

1. Provide, flush-mounted in car operating panel, with illuminating push-button, 2-way speaker and required visual and tactile signage. Include line consolidator to allow up to ten elevator phones to be installed on a single phone line. Where required by New York City Building Code for car to machine room communication, include machine room communication unit.

B. Type 2: Intercommunication system backed up by Emergency Battery Operating System for all elevators must be provided as part of this work. Provide all wiring and conduits between elevators and the intercom stations. The system must contain the following stations:

STATION LOCATION	TYPE STATION	SELECTION BUTTONS TO CALL
Each Machine Room	Master	Elevator Cars In That Group, Fire Command Panels, Lobby Station
Lobby Station	Master	Elevator Machine Rooms, All Elevator Cars, Fire Command Center
Fire Command Panel	Master	All Elevator Machine Rooms, All Elevator Cars, Lobby Station
Elevator Cars	Remote	Fire Command Center Panel

C. Type 3 (NYC Appendix K 2022): Provide emergency two-way communication system that:

1. Provides a communication means between the elevator car and a location staffed by authorized personnel who can take appropriate action.
2. Provides two-way voice communication between the elevator car and elevator machine or controller room.
3. Has a push button permanently identified with the “PHONE” symbol. Two-way communication must be initiated when the push button is actuated.
4. On the same panel as the “PHONE” push button, a message must be displayed that is activated by authorized personnel to acknowledge that communications are established. Messages must be displayed which permit authorized personnel to communicate with and obtain responses from trapped passenger(s) including passenger(s) who cannot verbally communicate or cannot hear.
5. Has a means to display video to observe passengers at any location on the car floor to authorized personnel.
6. Basis of Design Product: Subject to compliance with requirements, provide Avire, Rath SmartView Visual Communication System or comparable product by one of the following:

    a. Schindler
    b. Krone

c. Or approved equal.

7. Provide all required power supply and traveling cable conductors.

2. 13 PERFORMANCE

A. Speed: ±10% under any loading condition or travel direction.

B. Capacity: Safely lower, stop and hold up to 125% of the rated load

C. Isolation: All equipment (including controllers, power units, pumps, oil lines, and support equipment) must be mechanically isolated from the structure and electrically isolated from the building power supply and each other to prevent noise and vibration being transmitted to occupied area of the building.

D. Measured noise levels relating to elevator equipment and its operation must not exceed the following:

1. In car, door opening or closing: 67 dBA.
2. In operating car at rated speed: 65 dBA.
3. In stationary car, fan on highest speed, door closed: 60 dBA
4. In machine room, one elevator operating: 85 dBA
5. At elevator landing, one elevator operating: 65 dBA
6. Notes: measurements with cab fan off, unless otherwise noted; 50 dBA maximum ambient.

E. Stopping Accuracy: ±1/4” under any car loading condition.

F. Pressure: Fluid system components must be designed and factory tested for 1,000 p.s.i Maximum operating pressure must be 600 p.s.i.

G. Door Times: The door opening time must be measured from the instant the doors start to open until they are in the fully open position.

H. Floor-to-Floor Time: Floor-to-floor time must be measured from the instant the doors start to close at one floor until the car is level and stopped at the next floor. Doors must not be more than 3/4 open (1/2 open on Service Elevators) before the car is level and stopped. These performance times must be obtainable with dependable, consistent operation without undue wear or stress on the equipment and without excessive maintenance. The elevator must provide a comfortable ride with smooth acceleration, retardation and a soft stop.

1. The door opening times, door closing times and time to travel from floor to floor under any loading condition must not exceed the following:

ELEVATOR	DOOR OPENING TIME	DOOR CLOSING TIME*	FLOOR HEIGHT	FLOOR TO FLOOR
Elevator 1	2.8 sec.	3.4 sec.	10’ 0” B - 1	14.0 sec. ± 0.5 sec.

PART 3 – EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 SITE CONDITIONS AND INSPECTION

A. Before manning the job, examine the hoistway, pit and machine/controller room areas and verify that no irregularities exist that could adversely affect quality of the work as designed. Particularly, note:

1. Hoistway size and plumb.
2. Support areas for brackets, beams, etc.
3. Building and divider beams.
4. Hoistway sill support provisions when required.
5. Entrance rough openings.
6. Embedments and inserts.

B. Notify the Contractor if any discrepancies exist in the building work that will prevent the installation of the elevator equipment.

3.3 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Materials must be delivered in Manufacturer’s original, unopened protective packaging.

B. Materials must be stored in their original protective packaging. Locate in a dry storage area to prevent soiling, physical or water damage

C. Equipment and exposed finishes must be protected during transportation, erection and construction period against damage and stains.

D. Store early delivery elevator equipment offsite until it is needed for installation at the jobsite.

3.4 INSTALLATION

A. Equipment must be installed in accordance with accepted Manufacturer’s means and methods, referenced codes, specifications and approved submittals.

B. Machine room equipment must be installed with clearances complying with referenced codes and specifications.

C. Equipment must be installed so that access for maintenance is safe and readily available.

D. Install equipment to afford maximum safety and continuity of operation after a seismic event, for installations conforming to IBC seismic requirements.

E. Add equipment identification numerals.

3.5 FIELD QUALITY CONTROL

A. Work at the jobsite will be checked during the course of installation. Full cooperation with these Inspectors is mandatory. Any corrective work they require must be accomplished prior to performing further installation dependent upon or related to the required correction.

B. Have New York City Department of Buildings Inspector acceptance inspection performed. Verification that such tests have been completed, all corrective work accomplished and installation approved for issuance of a permit to operate must be required before acceptance of any unit.

3.6 ADJUSTMENTS

A. Align guide rails vertically within Manufacturer's specified tolerance. Joints must be secured without gaps and filed to remove any irregularities to create a smooth surface.

B. The elevator cars must be statically balanced to equalize pressure of roller guide shoes on rails.

C. Equipment must be lubricated in accordance with Manufacturer's instructions.

D. Motors, valves, controllers, leveling switches, limit switches, stopping switches, door operators, interlocks and safety devices must be adjusted to achieve required performance levels.

E. Fabricate and assemble the various parts in the shop insofar as practical to minimize field assembly. Parts which cannot be shop assembled or require close field fit must be trial assembled in the shop and marked for field erection.

3.7 CLEANUP AND TOUCHUP

A. The work areas must be maintained in an orderly and free from debris manner during the progress of the project.

B. Loose materials and filings resulting from this work must be removed from the hoistway.

C. The machine room equipment and floor must be cleaned of dirt, oil and grease.

D. The hoistway, car, car enclosures, entrances, operating and signal fixtures, and trim must be cleaned of dirt, oil, grease and finger marks. All protective plastic wrap on doors, entrance frames and cab enclosures must be completely removed prior to turnover

E. Touchup all minor scratches, dings or imperfections in finished materials and painted surfaces that are exposed to public view.

3.8 ACCEPTANCE INSPECTIONS AND TEST

A. Furnish personnel, equipment and instruments to perform required tests.

B. Final acceptance of the installation must be made after Manufacturer's field quality control inspections, ride quality measurements and New York City Department of Buildings tests are complete. The following will then be reviewed:

1. Workmanship and equipment for compliance with specification.
2. Contract speed, capacity and floor-to-floor performance compliance with specification.
3. Performance of following:

a. Starting, accelerating, running.
b. Decelerating, leveling, stopping
c. Performance times.
d. Door operation and closing force.
e. Fixture operation.
f. Communication systems.
g. Overall ride quality.

C. Ride Quality: Provide ride quality measurements taken to demonstrate compliance to the specification.

D. Should these reviews identify any defects or poor workmanship, any code variance or any variance from these specifications; repair, replacement or adjustment and retesting must be made at no additional expense.

3.9 CITY OF NEW YORK'S INFORMATION

A. Provide the following:

1. Owner's Manuals in written and electronic format.
2. As-built wiring diagrams in bound format.

3.10 WARRANTY INSPECTION

A. 30 days prior to warranty expiration, schedule final inspection and retest with Commissioner. Requirements must include examination of all equipment.

B. Replace, repair or adjust any equipment found defective and covered by warranty prior to expiration of Contractor's guarantee period.

END OF SECTION 14 24 00

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 22 05 00 - COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes:
1. Piping materials and installation instructions common to most piping systems.
2. Dielectric fittings.
3. Mechanical sleeve seals.
4. Sleeves.
5. Escutcheons.
6. Grout.
7. Plumbing demolition.
8. Equipment installation requirements common to equipment sections.
9. Concrete bases.
10. Supports and anchorages.

B. Related Sections

1. Section 221113 “Facility Water Distribution Piping” for domestic water service piping and fittings.
2. Section 221316 “Sanitary Waste and Vent Piping” for sanitary waste and vent piping and fittings.
3. Section 221413 “Facility Storm Drainage Piping” for storm drainage piping and fittings.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Welding Certificates.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Electrical Characteristics for Plumbing Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment must comply with requirements.

1.6 DEFINITIONS

A. Finished Spaces: Spaces other than plumbing and electrical equipment rooms, furred spaces, pipe chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and plumbing equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in chases.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

PART 2 - PRODUCTS

2.1 PIPE, TUBE, AND FITTINGS

A. Refer to Section 221113 “Facility Water Distribution Piping”, Section 221316 “Sanitary Waste and Vent Piping”, Section 221413 “Facility Storm Drainage Piping” for pipe, tube, and fitting materials and joining methods.

B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.2 JOINING MATERIALS

A. Refer to Section 221113 “Facility Water Distribution Piping”, Section 221316 “Sanitary Waste and Vent Piping”, Section 221413 “Facility Storm Drainage Piping” for special joining materials not listed below.

B. Pipe-Flange Gasket Materials: ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch (3.2-mm) maximum thickness unless thickness or specific material is indicated.

C. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

D. Brazing Filler Metals: AWS A5.8, BCuP Series or BAg1, unless otherwise indicated.

2.3 DIELECTRIC FITTINGS

A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.

B. Insulating Material: Suitable for system fluid, pressure, and temperature.

C. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig (1725-kPa) minimum working pressure at 180 deg F (82 deg C).

D. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 300-psig (1035- or 2070-kPa) minimum working pressure as required to suit system pressures.

E. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C).

F. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig (2070-kPa) minimum working pressure at 225 deg F (107 deg C).

2.4 MECHANICAL SLEEVE SEALS

A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.

B. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.

C. Pressure Plates: Carbon steel. Include two for each sealing element.

D. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.5 SLEEVES

A. Galvanized-Steel Sheet: 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint.

B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.

C. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

D. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.

1. Underdeck Clamp: Clamping ring with set screws.

2.6 ESCUTCHEONS

A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.

B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.

C. One-Piece, Cast-Brass Type: With set screw.
1. Finish: Polished chrome-plated and rough brass.

D. Split-Casting, Cast-Brass Type: With concealed hinge and set screw.
1. Finish: Polished chrome-plated and rough brass.

2.7 GROUT

A. Description: ASTM C 1107, Grade B, non-shrink and nonmetallic, dry hydraulic-cement grout.
1. Characteristics: Post-hardening, volume-adjusting, non-staining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
2. Design Mix: 5000-psi 28-day compressive strength.
3. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PIPING SYSTEMS - COMMON REQUIREMENTS

A. Install piping according to the requirements of Section 221113 “Facility Water Distribution Piping”, Section 221316 “Sanitary Waste and Vent Piping”, Section 221413 “Facility Storm Drainage Piping” specifying piping systems.

B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping to permit valve servicing.

G. Install piping at indicated slopes.

H. Install piping free of sags and bends.

I. Install fittings for changes in direction and branch connections.

J. Install piping to allow application of insulation.

K. Select system components with pressure rating equal to or greater than system operating pressure.

L. Install escutcheons for penetrations of walls, ceilings, and floors.

M. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.

N. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

1. Install steel pipe for sleeves smaller than 6 inches (150 mm) in diameter.
2. Install cast-iron "wall pipes" for sleeves 6 inches (150 mm) and larger in diameter.
3. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

O. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

1. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

P. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials.

Q. Verify final equipment locations for roughing-in.

3.3 PIPING JOINT CONSTRUCTION

A. Join pipe and fittings according to the requirements of Section 221113 “Facility Water Distribution Piping”, Section 221316 “Sanitary Waste and Vent Piping”, Section 221413 “Facility Storm Drainage Piping” specifying piping systems.

B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.

F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

G. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.4 PIPING CONNECTIONS

A. Make connections according to the following, unless otherwise indicated:

   1. Install unions, in piping NPS 2 (DN 50) and smaller, adjacent to each valve and at final connection to each piece of equipment.
   2. Install flanges, in piping NPS 2-1/2 (DN 65) and larger, adjacent to flanged valves and at final connection to each piece of equipment.
   3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
   4. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.5 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.

B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.

C. Install plumbing equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

D. Install equipment to allow right of way for piping installed at required slope.

3.6 CONCRETE BASES

A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions.
   1. Construct concrete bases of dimensions indicated, but not less than 4 inches (100 mm) larger in both directions than supported unit.
   2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around the full perimeter of the base.
   3. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
   4. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   5. Install anchor bolts to elevations required for proper attachment to supported equipment.
   6. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
   7. Use 3000-psi 28-day compressive-strength concrete and reinforcement.

3.7 ERECTION OF METAL SUPPORTS AND ANCHORAGES

A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor plumbing materials and equipment.

B. Field Welding: Comply with AWS D1.1.

3.8 GROUTING

A. Mix and install grout for plumbing equipment base bearing surfaces, pump and other equipment base plates, and anchors.

B. Clean surfaces that will come into contact with grout.

C. Provide forms as required for placement of grout.

D. Avoid air entrapment during placement of grout.

E. Place grout, completely filling equipment bases.

F. Place grout on concrete bases and provide smooth bearing surface for equipment.

G. Place grout around anchors.

H. Cure placed grout.

END OF SECTION 22 05 00

SECTION 22 05 23 - GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:

1. Brass ball valves.
2. Bronze ball valves.
3. Iron, single-flange butterfly valves.
4. Bronze swing check valves.
5. Iron swing check valves.
6. Iron swing check valves with closure control.
7. Bronze gate valves.
8. Iron gate valves.
9. Bronze globe valves.
10. Iron globe valves.

B. Related Sections:

1. Section 221113 “Facility Water Distribution Piping” for specialty valves.
2. Section 220553 "Identification for Plumbing Piping and Equipment" for valve tags and schedules.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each type of valve indicated.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. ASME Compliance: ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.

C. NSF Compliance: NSF 61 for valve materials for potable-water service.

1.6 WARRANTY

A. Manufacturer must provide product warranty extending 12 months from substantial completion.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

A. Refer to valve schedule articles for applications of valves.

B. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.

C. Valve Sizes: Same as upstream piping unless otherwise indicated.

D. Valve Actuator Types:

1. Gear Actuator: For quarter-turn valves NPS 8 (DN 200) and larger.
2. Handwheel: For valves other than quarter-turn types.
3. Hand lever: For quarter-turn valves NPS 6 (DN 150) and smaller except plug valves.
4. Chainwheel: Device for attachment to valve handwheel, stem, or other actuator; of size and with chain for mounting height, as indicated in the "Valve Installation" Article.

E. Valves in Insulated Piping: With 2-inch (50-mm) stem extensions and the following features:

1. Gate Valves: With rising stem.
2. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.
3. Butterfly Valves: With extended neck.

F. Valve-End Connections:

1. Flanged: With flanges according to ASME B16.1 for iron valves.
2. Solder Joint: With sockets according to ASME B16.18.
3. Threaded: With threads according to ASME B1.20.1.

2.2 BRONZE BALL VALVES

A. Two-Piece, Full-Port, “Lead-Free” certified, Bronze Ball Valves with Bronze Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Valve, Inc.
b. Conbraco Industries, Inc.; Apollo Valves.
c. Crane Co.; Crane Valve Group; Crane Valves.

d. Milwaukee Valve Company.
e. NIBCO INC.
f. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
g. Or approved equal.

2. Description:

a. Standard: MSS SP-110.
b. SWP Rating: 150 psig.
c. CWP Rating: 600 psig.
d. Body Design: Two piece.
e. Body Material: Bronze.
f. Ends: Threaded.
g. Seats: PTFE or TFE.
h. Stem: Bronze.
i. Ball: Chrome-plated brass.
j. Port: Full.

2.3 BRONZE SWING CHECK VALVES

A. Class 125, "Lead-Free" certified, Bronze Swing Check Valves with Bronze Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Valve, Inc.
b. Crane Co.; Crane Valve Group; Crane Valves.
c. Crane Co.; Crane Valve Group; Stockham Division.
d. Milwaukee Valve Company.
e. NIBCO INC.
f. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
g. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 3.
b. CWP Rating: 200 psig.
c. Body Design: Horizontal flow.
d. Body Material: ASTM B 62, bronze.
e. Ends: Threaded.
f. Disc: Bronze.

2.4 BRONZE GATE VALVES

A. Class 125, "Lead-Free" certified, RS Bronze Gate Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Valve, Inc.

b. Crane Co.; Crane Valve Group; Crane Valves.
c. Crane Co.; Crane Valve Group; Stockham Division.
d. Milwaukee Valve Company.
e. NIBCO INC.
f. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
g. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 2.
b. CWP Rating: 200 psig.
c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.
d. Ends: Threaded.
e. Stem: Bronze.
f. Disc: Solid wedge; bronze.
g. Packing: Asbestos free.
h. Handwheel: Malleable iron.

2.5 IRON GATE VALVES

A. Class 125, OS&Y, Iron Gate Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Crane Co.; Crane Valve Group; Stockham Division.
d. Milwaukee Valve Company.
e. NIBCO INC.
f. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
g. Or approved equal.

2. Description:

a. Standard: MSS SP-70, Type I.
b. CWP Rating: 200 psig
c. Body Material: ASTM A 126, gray iron with bolted bonnet.
d. Ends: Flanged.
e. Trim: Bronze.
f. Disc: Solid wedge.
g. Packing and Gasket: Asbestos free.

2.6 BRONZE GLOBE VALVES

A. Class 125, “Lead-Free” certified, Bronze Globe Valves with Bronze Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Stockham Division.
c. Hammond Valve.
d. Kitz Corporation.
e. Milwaukee Valve Company.
f. NIBCO INC.
g. Powell Valves.
h. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
i. Or approved equal.

2. Description:

a. Standard: MSS SP-80, Type 1.
b. CWP Rating: 200 psig
c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.
d. Ends: Threaded.
e. Stem and Disc: Bronze.
f. Packing: Asbestos free.
g. Handwheel: Malleable iron.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 VALVE INSTALLATION

A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.

B. Locate valves for easy access and provide separate support where necessary.

C. Install valves in horizontal piping with stem at or above center of pipe.

D. Install valves in position to allow full stem movement.

3.3 ADJUSTING

A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.4 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

A. If valve applications are not indicated, use the following:

1. Shutoff Service: Ball or gate valves.

2. Throttling Service: Globe valves.
3. Pump-Discharge Check Valves:

   a. NPS 2 and Smaller: Bronze swing check valves with bronze disc.

B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP class or CWP ratings may be substituted.

C. Select valves, except wafer types, with the following end connections:

1. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
2. For Steel Piping, NPS 2 and Smaller: Threaded ends.

3.5 DOMESTIC, HOT- AND COLD-WATER VALVE SCHEDULE

A. Domestic Water Service Pipe NPS 2 (DN 50) and Smaller (including MOCV and MICV):

1. House Control Valve: Gate OS&Y Valve, Class 125.
2. MICV and MOCV: Full Port Ball Valve.

B. Distribution Pipe NPS 2 (DN 50) and Smaller:

1. Bronze Valves: May be provided with solder-joint ends instead of threaded ends.
2. Bronze Angle Valves: Class 125, bronze disc.
3. Ball Valves: Two piece, full port, bronze with bronze trim.
4. Bronze Swing Check Valves: Class 125, bronze disc.
5. Bronze Gate Valves: Class 125, RS.
6. Bronze Globe Valves: Class 125, bronze disc.
7. Iron Gate Valves: Class 125, OS&Y.

END OF SECTION 22 05 23

SECTION 22 05 29 - HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes:

1. Steel pipe hangers and supports.
2. Trapeze pipe hangers.
3. Metal framing systems.
4. Thermal-hanger shield inserts.
5. Fastener systems.
6. Equipment supports.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For the following:

1. Steel pipe hangers and supports.
2. Thermal-hanger shield inserts.
3. Powder-actuated fastener systems.

B. Shop Drawings: Show fabrication and installation details and include calculations for the following:

1. Trapeze pipe hangers. Include Product Data for components.
2. Metal framing systems. Include Product Data for components.
3. Equipment supports.

C. Welding certificates.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Welding: Qualify procedures and personnel according to ASME Boiler and Pressure Vessel Code: Section IX.

1.6 DEFINITIONS

A. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.7 WARRANTY

A. Manufacturer must provide product warranty extending 12 months from date of substantial completion.

PART 2 - PRODUCTS

2.1 STEEL PIPE HANGERS AND SUPPORTS

A. Description: MSS SP-58, Types 1 through 58, factory-fabricated components. Refer to Part 3 "Hanger and Support Applications" Article for where to use specific hanger and support types.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AAA Technology & Specialties Co., Inc.
2. Bergen-Power Pipe Supports.
3. B-Line Systems, Inc.; a division of Cooper Industries.
4. Carpenter & Paterson, Inc.
5. Empire Industries, Inc.
6. ERICO/Michigan Hanger Co.
7. Globe Pipe Hanger Products, Inc.
8. Grinnell Corp.
9. GS Metals Corp.
10. National Pipe Hanger Corporation.
11. PHD Manufacturing, Inc.
12. PHS Industries, Inc.
13. Piping Technology & Products, Inc.
14. Tolco Inc.
15. Or approved equal.

C. Galvanized, Metallic Coatings: Pre-galvanized or hot dipped.

D. Nonmetallic Coatings: Plastic coating, jacket, or liner.

E. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion for support of bearing surface of piping.

2.2 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural-steel shapes with MSS SP-58 hanger rods, nuts, saddles, and U-bolts.

2.3 METAL FRAMING SYSTEMS

A. Description: MFMA-3, shop- or field-fabricated pipe-support assembly made of steel channels and other components.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. B-Line Systems, Inc.; a division of Cooper Industries.
2. ERICO/Michigan Hanger Co.; ERISTRUT Div.
3. GS Metals Corp.
4. Power-Strut Div.; Tyco International, Ltd.
5. Thomas & Betts Corporation.
6. Tolco Inc.
7. Unistrut Corp.; Tyco International, Ltd.
8. Or approved equal.

C. Coatings: Manufacturer's standard finish, unless bare metal surfaces are indicated.

D. Nonmetallic Coatings: Plastic coating, jacket, or liner.

2.4 THERMAL-HANGER SHIELD INSERTS

A. Description: 100-psig- (690-kPa-) minimum, compressive-strength insulation insert encased in sheet metal shield.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Carpenter & Paterson, Inc.
2. ERICO/Michigan Hanger Co.
3. PHS Industries, Inc.
4. Pipe Shields, Inc.
5. Rilco Manufacturing Company, Inc.
6. Value Engineered Products, Inc.
7. Or Approved Equal

C. Insulation-Insert Material for Cold Piping: Water-repellent treated, ASTM C 552, Type I calcium silicate or Type II ASTM C552 cellular glass with vapor barrier.

D. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 552, Type I calcium silicate, ASTM C 552, Type II cellular glass.

E. For Trapeze or Clamped Systems: Insert and shield must cover entire circumference of pipe.

F. For Clevis or Band Hangers: Insert and shield must cover lower 180 degrees of pipe.

G. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.5 FASTENER SYSTEMS

A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Hilti, Inc.
b. ITW Ramset/Red Head.
c. Masterset Fastening Systems, Inc.
d. MKT Fastening, LLC.
e. Powers Fasteners.
f. Or approved equal.

B. Mechanical-Expansion Anchors: Insert-wedge-type zinc-coated steel, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

1. Manufacturers: Subject to compliance with requirements, provide by one of the following:

a. B-Line Systems, Inc.; a division of Cooper Industries.
b. Empire Industries, Inc.
c. Hilti, Inc.
d. ITW Ramset/Red Head.
e. MKT Fastening, LLC.
f. Powers Fasteners.
g. Or approved equal.

2.6 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural-steel shapes.

2.7 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, non-shrink and nonmetallic grout; suitable for interior and exterior applications.

1. Properties: Non-staining, noncorrosive, and nongaseous.
2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 HANGER AND SUPPORT APPLICATIONS

A. Specific hanger and support requirements are specified in Sections 221116 “Domestic Water Piping”, 221316 “Sanitary Water and Vent Piping”, 221413 “Facility Storm Drainage Piping”.

B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in Sections 221116 “Domestic Water Piping”, 221316 “Sanitary Water and Vent Piping”, 221413 “Facility Storm Drainage Piping”.

C. Use hangers and supports with galvanized, metallic coatings for piping and equipment that will not have field-applied finish.

D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

E. Use padded hangers for piping that is subject to scratching.

F. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections 221116 “Domestic Water Piping”, 221316 “Sanitary Water and Vent Piping”, 221413 “Facility Storm Drainage Piping”, install the following types:

1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of non-insulated or insulated stationary pipes, NPS 1/2 to NPS 30 (DN 15 to DN 750).
2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of 120 to 450 deg F (49 to 232 deg C) pipes, NPS 4 to NPS 16 (DN 100 to DN 400), requiring up to 4 inches (100 mm) of insulation.
3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes, NPS 3/4 to NPS 24 (DN 20 to DN 600), requiring clamp flexibility and up to 4 inches (100 mm) of insulation.
4. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 8 (DN 15 to DN 200).
5. U-Bolts (MSS Type 24): For support of heavy pipes, NPS 1/2 to NPS 30 (DN 15 to DN 750).
6. Pipe Saddle Supports (MSS Type 36): For support of pipes, NPS 4 to NPS 36 (DN 100 to DN 900), with steel pipe base stanchion support and cast-iron floor flange.
7. Single Pipe Rolls (MSS Type 41): For suspension of pipes, NPS 1 to NPS 30 (DN 25 to DN 750), from 2 rods if longitudinal movement caused by expansion and contraction might occur.
8. Complete Pipe Rolls (MSS Type 44): For support of pipes, NPS 2 to NPS 42 (DN 50 to DN 1050), if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.

G. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections 221116 “Domestic Water Piping”, 221316 “Sanitary Water and Vent Piping”, 221413 “Facility Storm Drainage Piping”, install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 20 (DN 20 to DN 500).
2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers, NPS 3/4 to NPS 20 (DN 20 to DN 500), if longer ends are required for riser clamps.

H. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections 221116 "Domestic Water Piping", 221316 "Sanitary Water and Vent Piping", 221413 "Facility Storm Drainage Piping", install the following types:

1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches (150 mm) for heavy loads.
2. Steel Clevises (MSS Type 14): For 120 to 450 deg F (49 to 232 deg C) piping installations.

I. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections 221116 "Domestic Water Piping", 221316 "Sanitary Water and Vent Piping", 221413 "Facility Storm Drainage Piping", install the following types:

1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction to attach to top flange of structural shape.
3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
6. C-Clamps (MSS Type 23): For structural shapes.
7. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:

    a. Light (MSS Type 31): 750 lb (340 kg).
    b. Medium (MSS Type 32): 1500 lb (680 kg).
    c. Heavy (MSS Type 33): 3000 lb (1360 kg).

8. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
9. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.

J. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections 221116 "Domestic Water Piping", 221316 "Sanitary Water and Vent Piping", 221413 "Facility Storm Drainage Piping", install the following types:

1. Steel Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

K. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections 221116 "Domestic Water Piping", 221316 "Sanitary Water and Vent Piping", 221413 "Facility Storm Drainage Piping", install the following types:

1. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches (32 mm).
2. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41 roll hanger with springs.
3. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from base support.

L. Comply with MSS SP-69 for trapeze pipe hanger selections and applications that are not specified in piping system Sections 221116 "Domestic Water Piping", 221316 "Sanitary Water and Vent Piping", 221413 "Facility Storm Drainage Piping".

M. Comply with MFMA-102 for metal framing system selections and applications that are not specified in piping system Sections 221116 "Domestic Water Piping", 221316 "Sanitary Water and Vent Piping", 221413 "Facility Storm Drainage Piping".

N. Use powder-actuated fastener or mechanical-expansion anchors instead of building attachments where required in concrete construction.

3.3 HANGER AND SUPPORT INSTALLATION

A. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.

B. Trapeze Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping and support together on field-fabricated trapeze pipe hangers.

1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.
2. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D1.1.

C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled metal framing systems.

D. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.

E. Fastener System Installation:

1. Install powder-actuated fasteners in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

F. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.

G. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

H. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

I. Install lateral bracing with pipe hangers and supports to prevent swaying.

J. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

K. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

L. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9 (for building services piping) are not exceeded.

M. Insulated Piping: Comply with the following:

1. Attach clamps and spacers to piping.

   a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
   b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
   c. Do not exceed pipe stress limits according to ASME B31.9 for building services piping.

2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields must span an arc of 180 degrees.

4. Shield Dimensions for Pipe: Not less than the following:

   a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
   b. NPS 4: 12 inches long and 0.06 inch thick.
   c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.

5. Pipes NPS 8 and Larger: Include wood inserts.
6. Insert Material: Length at least as long as protective shield.
7. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.4 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make smooth bearing surface.

C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.5 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1 procedures for shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work, and with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Finish welds at exposed connections so no roughness shows after finishing and contours of welded surfaces match adjacent contours.

3.6 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

3.7 PAINTING

A. Touch Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).

END OF SECTION 22 05 29

THIS SECTION INTENTIONALLY LEFT BLANK

SECTION 22 05 53 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:

1. Equipment labels.
2. Warning signs and labels.
3. Pipe labels.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.6 WARRANTY

A. Manufacturer must provide product warranty extending 12 months from substantial completion.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

A. Metal Labels for Equipment:

1. Material and Thickness: Brass, 0.032-inch (0.8-mm) or Stainless steel, 0.025-inch (0.64-mm), Aluminum, 0.032-inch (0.8-mm) or anodized aluminum, 0.032-inch (0.8-mm) minimum thickness and having predrilled or stamped holes for attachment hardware.
2. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch (64 by 19 mm).
3. Minimum Letter Size: 1/4 inch (6.4 mm) for name of units if viewing distance is less than 24 inches (600 mm), 1/2 inch (13 mm) for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
4. Fasteners: Stainless-steel rivets or self-tapping screw.
5. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Plastic Labels for Equipment:
1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch (1.6 mm) thick, and having predrilled holes for attachment hardware.
2. Letter Color: Black.
3. Background Color: White.
4. Maximum Temperature: Able to withstand temperatures up to 160 deg F (71 deg C).
5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch (64 by 19 mm).
6. Minimum Letter Size: 1/4 inch (6.4 mm) for name of units if viewing distance is less than 24 inches (600 mm), 1/2 inch (13 mm) for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
7. Fasteners: Stainless-steel rivets.
8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.

D. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch (A4) bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.2 WARNING SIGNS AND LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.

B. Letter Color: Black.

C. Background Color: Yellow.

D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch (64 by 19 mm).

F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

G. Fasteners: Stainless-steel rivets.

H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

I. Label Content: Include caution and warning information, plus emergency notification instructions.

2.3 PIPE LABELS

A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.

B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to partially cover or cover full circumference of pipe and to attach to pipe without fasteners or adhesive.

C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.

D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
   1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
   2. Lettering Size: At least 1-1/2 inches (38 mm) high.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.3 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of mechanical equipment.

B. Locate equipment labels where accessible and visible.

3.4 PIPE LABEL INSTALLATION

A. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
   1. Near each valve and control device.
   2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
   3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
   4. At access doors, manholes, and similar access points that permit view of concealed piping.
   5. Near major equipment items and other points of origination and termination.
   6. Spaced at maximum intervals of 50 feet (15 m) along each run. Reduce intervals to 25 feet (7.6 m) in areas of congested piping and equipment.
   7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.

B. Pipe Label Color Schedule:

   1. Domestic Water Piping:
      a. Background Color: Green.
      b. Letter Color: White.

   2. Sanitary Waste, Vent and Storm Drainage Piping:
      a. Background Color: White.
      b. Letter Color: Black.

END OF SECTION 22 05 53

SECTION 22 07 00 - PLUMBING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:
1. Insulation Materials:
   a. Flexible elastomeric.
   b. Mineral fiber.
2. Insulating cements.
3. Adhesives.
4. Mastics.
5. Sealants.
6. Factory-applied jackets.
7. Field-applied fabric-reinforcing mesh.
8. Field-applied jackets.
9. Tapes.
10. Securements.
11. Corner angles.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings:
1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
2. Detail attachment and covering of heat tracing inside insulation.
3. Detail insulation application at pipe expansion joints for each type of insulation.
4. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
5.
6. Detail removable insulation at piping specialties, equipment connections, and access panels.
7. Detail application of field-applied jackets.
8. Detail application at linkages of control devices.

9. Detail field application for each equipment type.

C. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Fire-Test-Response Characteristics: Insulation and related materials must have fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing and inspecting agency.
   1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
   2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.6 WARRANTY

A. Manufacturer must provide product warranty extending 12 months from substantial completion.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Comply with requirements in Part 3 schedule articles for where insulating materials must be applied.

B. Products must not contain asbestos, lead, mercury, or mercury compounds.

C. Products that come in contact with stainless steel must have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

D. Insulation materials for use on austenitic stainless steel must be qualified as acceptable according to ASTM C 795.

E. Foam insulation materials must not use CFC or HCFC blowing agents in the manufacturing process.

F. Mineral-Fiber, Preformed Pipe Insulation:
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Fibrex Insulations Inc.; Coreplus 1200.
      b. Johns Manville; Micro-Lok.
      c. Knauf Insulation; 1000 Pipe Insulation.
      d. Manson Insulation Inc.; Alley-K.
      e. Owens Corning; Fiberglas Pipe Insulation.

f. Or approved equal.

2. Type I, 850 deg F (454 deg C) Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

G. Mineral-Fiber, Pipe and Tank Insulation: Mineral or glass fibers bonded with a thermosetting resin. Semirigid board material with factory-applied ASJ jacket complying with ASTM C 1393, Type II or Type IIIA Category 2, or with properties similar to ASTM C 612, Type IB. Nominal density is 2.5 lb/cu. ft. (40 kg/cu. m) or more. Thermal conductivity (k-value) at 100 deg F (55 deg C) is 0.29 Btu x in./h x sq. ft. x deg F (0.042 W/m x K) or less. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. CertainTeed Corp.; CrimpWrap.
   b. Johns Manville; MicroFlex.
   c. Knauf Insulation; Pipe and Tank Insulation.
   d. Manson Insulation Inc.; AK Flex.
   e. Owens Corning; Fiberglas Pipe and Tank Insulation.
   f. Or approved equal.

2.2 INSULATING CEMENTS

A. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449/C 449M.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Insulco, Division of MFS, Inc.; SmoothKote.
   b. P. K. Insulation Mfg. Co., Inc.; PK No. 127, and Quik-Cote.
   c. Rock Wool Manufacturing Company; Delta One Shot.
   d. Or approved equal.

2.3 ADHESIVES

A. Materials must be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.

B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Childers Products, Division of ITW; CP-82.
   b. Foster Products Corporation, H. B. Fuller Company; 85-20.
   c. ITW TACC, Division of Illinois Tool Works; S-90/80.
   d. Marathon Industries, Inc.; 225.
   e. Mon-Eco Industries, Inc.; 22-25.
   f. Or approved equal.

C. ASJ Adhesive, and FSK and PVDC Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Childers Products, Division of ITW; CP-82.
b. Foster Products Corporation, H. B. Fuller Company; 85-20.
c. ITW TACC, Division of Illinois Tool Works; S-90/80.
d. Marathon Industries, Inc.; 225.
e. Mon-Eco Industries, Inc.; 22-25.
f. Or approved equal.

D. PVC Jacket Adhesive: Compatible with PVC jacket.

1. Products: Subject to compliance with requirements, provide one of the following:
a. Dow Chemical Company (The); 739, Dow Silicone.
b. Johns-Manville; Zeston Perma-Weld, CEEL-TITE Solvent Welding Adhesive.
c. P.I.C. Plastics, Inc.; Welding Adhesive.
d. Red Devil, Inc.; Celulon Ultra Clear.
e. Speedline Corporation; Speedline Vinyl Adhesive.
f. Or approved equal.

2.4 MASTICS

A. Materials must be compatible with insulation materials, jackets, and substrates; comply with MIL-C-19565C, Type II.

B. Vapor-Barrier Mastic: Water based; suitable for indoor and outdoor use on below ambient services.

1. Products: Subject to compliance with requirements, provide one of the following:
a. Childers Products, Division of ITW; CP-35.
b. Foster Products Corporation, H. B. Fuller Company; 30-90.
c. ITW TACC, Division of Illinois Tool Works; CB-50.
d. Marathon Industries, Inc.; 590.
e. Mon-Eco Industries, Inc.; 55-40.
f. Vimasco Corporation; 749.
g. Or approved equal.

2. Water-Vapor Permeance: ASTM E 96, Procedure B, 0.013 perm (0.009 metric perm) at 43-mil (1.09-mm) dry film thickness.
3. Service Temperature Range: Minus 20 to plus 180 deg F (Minus 29 to plus 82 deg C).
4. Solids Content: ASTM D 1644, 59 percent by volume and 71 percent by weight.
5. Color: White.

C. Breather Mastic: Water based; suitable for indoor and outdoor use on above ambient services.

1. Products: Subject to compliance with requirements, provide one of the following:
a. Childers Products, Division of ITW; CP-10.
b. Foster Products Corporation, H. B. Fuller Company; 35-00.
c. ITW TACC, Division of Illinois Tool Works; CB-05/15.
d. Marathon Industries, Inc.; 550.
e. Mon-Eco Industries, Inc.; 55-50.
f. Vimasco Corporation; WC-1/WC-5.
g. Or approved equal.

2. Water-Vapor Permeance: ASTM F 1249, 3 perms (2 metric perms) at 0.0625-inch (1.6-mm) dry film thickness.
3. Service Temperature Range: Minus 20 to plus 200 deg F (Minus 29 to plus 93 deg C).
4. Solids Content: 63 percent by volume and 73 percent by weight.
5. Color: White.

2.5 SEALANTS

A. Joint Sealants for Cellular-Glass Products:

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Childers Products, Division of ITW; CP-76.
   b. Foster Products Corporation, H. B. Fuller Company; 30-45.
   c. Marathon Industries, Inc.; 405.
   d. Mon-Eco Industries, Inc.; 44-05.
   e. Pittsburgh Corning Corporation; Pittseal 444.
   f. Vimasco Corporation; 750.
   g. Or approved equal.

B. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Childers Products, Division of ITW; CP-76.
   b. Foster Products Corporation, H. B. Fuller Company; 95-44.
   c. Marathon Industries, Inc.; 405.
   d. Or approved equal
2. Materials must be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F (Minus 40 to plus 121 deg C).
5. Color: White.

2.6 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.

2.7 FIELD-APPLIED JACKETS

A. Field-applied jackets must comply with ASTM C 921, Type I, unless otherwise indicated.

B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Johns Manville; Zeston.
b. P.I.C. Plastics, Inc.; FG Series.
c. Proto PVC Corporation; LoSmoke.
d. Speedline Corporation; SmokeSafe.
e. Or approved equal.

2. Adhesive: As recommended by jacket material manufacturer.
3. Color: White.
4. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.
   a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.
5. Factory-fabricated tank heads and tank side panels.

2.8 TAPES

A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0835.
   b. Compac Corp.; 104 and 105.
   c. Ideal Tape Co., Inc., an American Biltrite Company; 428 AWF ASJ.
   d. Or approved equal.
2. Width: 3 inches (75 mm).
3. Thickness: 11.5 mils (0.29 mm).
4. Adhesion: 90 ounces force/inch (1.0 N/mm) in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch (7.2 N/mm) in width.
7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

B. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive. Suitable for indoor and outdoor applications.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0555.
   b. Compac Corp.; 130.
   c. Ideal Tape Co., Inc., an American Biltrite Company; 370 White PVC tape.
   d. Venture Tape; 1506 CW NS.
   e. Or approved equal.
2. Width: 2 inches (50 mm).
3. Thickness: 6 mils (0.15 mm).
4. Adhesion: 64 ounces force/inch (0.7 N/mm) in width.
5. Elongation: 500 percent.
6. Tensile Strength: 18 lbf/inch (3.3 N/mm) in width.

2.9 SECUREMENTS

A. Aluminum Bands: ASTM B 209 (ASTM B 209M), Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch (0.51 mm) thick, 3/4 inch (19 mm) wide with wing or closed seal.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Childers Products; Bands.
   b. PABCO Metals Corporation; Bands.
   c. RPR Products, Inc.; Bands.
   d. Or approved equal.

B. Insulation Pins and Hangers:

1. Metal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:
   a. Products: Subject to compliance with requirements, provide one of the following:
      1) AGM Industries, Inc.; Tactoo Insul-Hangers, Series T.
      2) GEMCO; Perforated Base.
      3) Midwest Fasteners, Inc.; Spindle.
      4) Or approved equal.
   b. Baseplate: Perforated, galvanized carbon-steel sheet, 0.030 inch (0.76 mm) thick by 2 inches (50 mm) square.
   c. Spindle: Copper- or zinc-coated, low carbon steel, fully annealed, 0.106-inch- (2.6-mm-) diameter shank, length to suit depth of insulation indicated.
   d. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.
2. Nonmetal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate fastened to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:
   a. Products: Subject to compliance with requirements, provide one of the following:
      1) GEMCO; Nylon Hangers.
      2) Midwest Fasteners, Inc.; Nylon Insulation Hangers.
      3) AGM Industries, Inc; Nylon Insulation Hangers.
      4) Or approved equal.
   b. Baseplate: Perforated, nylon sheet, 0.030 inch (0.76 mm) thick by 1-1/2 inches (38 mm) in diameter.
   c. Spindle: Nylon, 0.106-inch- (2.6-mm-) diameter shank, length to suit depth of insulation indicated, up to 2-1/2 inches (63 mm).
   d. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.
3. Self-Sticking-Base Insulation Hangers: Baseplate welded to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:
   a. Products: Subject to compliance with requirements, provide one of the following:

1) AGM Industries, Inc.; Tactoo Insul-Hangers, Series TSA.
2) GEMCO; Press and Peel.
3) Midwest Fasteners, Inc.; Self Stick.
4) Or approved equal.

b. Baseplate: Galvanized carbon-steel sheet, 0.030 inch (0.76 mm) thick by 2 inches (50 mm) square.
c. Spindle: Copper- or zinc-coated, low carbon steel, fully annealed, 0.106-inch- (2.6-mm-) diameter shank, length to suit depth of insulation indicated.
d. Adhesive-backed base with a peel-off protective cover.

4. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- (0.41-mm-) thick, aluminum sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches (38 mm) in diameter.
a. Products: Subject to compliance with requirements, provide one of the following:
1) AGM Industries, Inc.; RC-150.
2) GEMCO; R-150.
3) Midwest Fasteners, Inc.; WA-150.
4) Nelson Stud Welding; Speed Clips.
5) Or approved equal.

b. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in exposed locations.

5. Nonmetal Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- (0.41-mm-) thick nylon sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches (38 mm) in diameter.
a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1) GEMCO.
2) Midwest Fasteners, Inc.
3) AGM Industries
4) Or approved equal

C. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.

D. Wire: 0.080-inch nickel-copper alloy.

2.10 CORNER ANGLES

A. PVC Corner Angles: 30 mils thick, minimum 1 by 1 inch, PVC according to ASTM D 1784, Class 16354-C. White or color-coded to match adjacent surface.

B. Aluminum Corner Angles: 0.040 inch thick, minimum 1 by 1 inch, aluminum according to ASTM B 209, Alloy 3003, 3005, 3105 or 5005; Temper H-14.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS:

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

C. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment and piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment and pipe system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during application and finishing.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
   1. Install insulation continuously through hangers and around anchor attachments.
   2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.

3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

L. Install insulation with factory-applied jackets as follows:
1. Draw jacket tight and smooth.
2. Cover circumferential joints with 3-inch- (75-mm-) wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches (100 mm) o.c.
3. Overlap jacket longitudinal seams at least 1-1/2 inches (38 mm). Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches (50 mm) o.c.
   a. For below ambient services, apply vapor-barrier mastic over staples.
4. Cover joints and seams with tape as recommended by insulation material manufacturer to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.

M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches (100 mm) beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

P. For above ambient services, do not install insulation to the following:
1. Vibration-control devices.
2. Testing agency labels and stamps.
3. Nameplates and data plates.
4. Manholes.
5. Handholes.
6. Cleanouts.

3.4 PENETRATIONS

A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install

insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches (50 mm) below top of roof flashing.
4. Seal jacket to roof flashing with flashing sealant.

B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.

C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches (50 mm).
4. Seal jacket to wall flashing with flashing sealant.

D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
1. Comply with requirements in Section 078413 “Penetration Firestopping” and Section 079200 “ Joint Sealants”.

F. Insulation Installation at Floor Penetrations:
1. Pipe: Install insulation continuously through floor penetrations.
2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 078413 “Penetration Firestopping” and . Section 079200 “ Joint Sealants”.

3.5 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity, unless otherwise indicated.
2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece must be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.

4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below ambient services, provide a design that maintains vapor barrier.
6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below ambient services and a breather mastic for above ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
9. Stencil or label the outside insulation jacket of each union with the word "UNION." Match size and color of pipe labels.

C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes, vessels, and equipment. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

D. Install removable insulation covers at locations indicated. Installation must conform to the following:
1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
3. Construct removable valve insulation covers in same manner as for flanges except divide the two-part section on the vertical center line of valve body.
4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches (50 mm) over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.

5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

3.6 FLEXIBLE ELASTOMERIC INSULATION INSTALLATION

A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Flanges:
1. Install pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as pipe insulation.
4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Pipe Fittings and Elbows:
1. Install mitered sections of pipe insulation.
2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Insulation Installation on Valves and Pipe Specialties:
1. Install preformed valve covers manufactured of same material as pipe insulation when available.
2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.
4. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.7 MINERAL-FIBER INSULATION INSTALLATION

A. Insulation Installation on Straight Pipes and Tubes:
1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above ambient surfaces, secure laps with outward clinched staples at 6 inches (150 mm) o.c.
4. For insulation with factory-applied jackets on below ambient surfaces, do not staple longitudinal tabs but secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

C. Insulation Installation on Valves and Pipe Specialties:
1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

3.8 FIELD-APPLIED JACKET INSTALLATION

A. Where PVC jackets are indicated, install with 1-inch (25-mm) overlap at longitudinal seams and end joints; for horizontal applications, install with longitudinal seams along top and bottom of tanks and vessels. Seal with manufacturer's recommended adhesive.
1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

B. Where PVDC jackets are indicated, install as follows:
1. Apply three separate wraps of filament tape per insulation section to secure pipe insulation to pipe prior to installation of PVDC jacket.
2. Wrap factory-presized jackets around individual pipe insulation sections with one end overlapping the previously installed sheet. Install presized jacket with an approximate overlap at butt joint of 2 inches (50 mm) over the previous section. Adhere lap seal using adhesive or SSL, and then apply 1-1/4 circumferences of appropriate PVDC tape around overlapped butt joint.
3. Continuous jacket can be spiral wrapped around a length of pipe insulation. Apply adhesive or PVDC tape at overlapped spiral edge. When electing to use adhesives, refer to manufacturer's written instructions for application of adhesives along this spiral edge to maintain a permanent bond.
4. Jacket can be wrapped in cigarette fashion along length of roll for insulation systems with an outer circumference of 33-1/2 inches (850 mm) or less. The 33-1/2-inch- (850-mm-) circumference limit allows for 2-inch- (50-mm-) overlap seal. Using the length of roll allows for longer sections of jacket to be installed at one time. Use adhesive on the lap seal. Visually inspect lap seal for "fishmouthing," and use PVDC tape along lap seal to secure joint.
5. Repair holes or tears in PVDC jacket by placing PVDC tape over the hole or tear and wrapping a minimum of 1-1/4 circumferences to avoid damage to tape edges.

3.9 FINISHES

A. Equipment and Pipe Insulation with ASJ or Other Paintable Jacket Material: Paint jacket with paint system identified below.

1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.
   a. Finish Coat Material: Interior, flat, latex-emulsion size.

B. Flexible Elastomeric Thermal Insulation: After the adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.

C. Color: Final color as selected by Commissioner. Vary first and second coats to allow visual inspection of the completed Work.

D. Do not field paint aluminum or stainless-steel jackets.

3.10 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:
   1. Inspect field-insulated equipment, randomly selected by Commissioner, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection must be limited to one location(s) for each type of equipment defined on plans. For large equipment, remove only a portion adequate to determine compliance.
   2. Inspect pipe, fittings, strainers, and valves, randomly selected by Commissioner, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection must be limited to three locations of straight pipe, three locations of threaded fittings, three locations of welded fittings, three locations of threaded valves, and three locations of flanged valves for each pipe for a service type.

C. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.11 PIPING INSULATION SCHEDULE, GENERAL

A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:

   1. Underground piping.
   2. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.12 INDOOR PIPING INSULATION SCHEDULE

A. Domestic Hot and Recirculated Hot Water: Insulation must be the following:

1. Mineral-Fiber, Preformed Pipe Insulation with factory applied jacket and PVC fittings, 1-inch for all pipes including branches up to and including 1-1/4"; 1.5-inch for pipes 1-1/2" and larger. For exposed pipe jacketing refer to section 3.17.

B. Domestic Cold Water (Potable): Insulation must be the following:

1. Mineral-Fiber, Preformed Pipe Insulation with factory applied jackets and PVC fittings, Type I: 1 inch for all pipes including branches. For exposed pipe jacketing refer to section 3.17.

C. Storm Water Pipes (Horizontal and Vertical):

1. Mineral-Fiber, Preformed Pipe Insulation with factory applied jacket and PVC fittings, Type I: 1inch for all pipes including branches.

3.13 INDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

B. Piping, Concealed:
1. None.

C. Hot, Hot Water Return and Cold Water Piping and Storm Water, Exposed:
1. PVC: 20 mils thick.

END OF SECTION 22 07 00

SECTION 22 08 00 - COMMISSIONING FOR PLUMBING SYSTEMS

PART I – GENERAL

1.1. RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2. SUMMARY

A. Commissioning consists of systematically documenting that specified components and systems have been installed and started up properly and then functionally tested to verify and document proper operation through all sequences of operation and conditions. In addition, instruction of the City of New York's operations personnel must be verified and final project O&M Documents must be reviewed for completeness.

1.3. QUALITY ASSURANCE

A. Reference Standards:

1. OSHA Part 1910; Subpart S. 1910.308.
2. American National Standards Institute: ANSI
3. American Society for Testing and Materials: ASTM
4. National Electrical Manufacturers Association: NEMA
5. National Fire Protection Association: NFPA
    a. National Electrical Code (NEC)

B. All inspections and tests must use the following references.

1. Contract Specifications.
2. Contract Drawings.
3. Manufacturer's instruction manuals and approved shop drawings for applicable equipment.

PART II – PRODUCTS

2.1. EQUIPMENT AND INSTRUMENTS FOR Cx PROCESS

A. The Contractor must furnish all tools, instruments, laptops, calibrated meters, software programs, personnel, and services required to perform the commissioning process. This includes providing the connection to systems to be tested, temporary alterations for test purposes, calibrations, operation of the test equipment & instrumentation and generating test results (as required), and the restoration of equipment/systems to original operating condition. A list of all tools and equipment to be used during commissioning must be submitted to the CxA for approval. The Contractor must furnish necessary utilities for the commissioning process.

B. Proprietary test equipment and software required by any equipment manufacturer for programming and/or start-up, whether specified or not, must be provided by the manufacturer of

the equipment. Proprietary test equipment (and software) must become the property of the City of New York upon completion of the commissioning process.

2.2. COMMISSIONING DOCUMENTATION

A. All documentation for the commissioning process must be entered into the CxA's commissioning project progress tracking software tool. The Contractor must be allowed web-based access to the software upon request. Additionally, the Contractor may download the CxA's mobile application to a tablet format. The mobile application is available in Apple, Android, and Windows format. There is no fee associated with the software or the mobile application. Contractor must allow sufficient time to familiarize themselves with the operation of the software.

PART III – EXECUTION

3.1. GENERAL

A. The Contractor must complete all phases of work so the systems can be started, tested, balanced, and acceptance procedures undertaken. This includes the complete installation of all equipment, materials, pipe, insulation, etc., per the Contract Documents and related directives, clarifications, and change orders.

3.2. PARTICIPATION IN ACCEPTANCE PROCEDURES

A. The Contractor must provide skilled technicians to startup and debug all systems within the project contracted work. These same technicians must be made available to assist the CxA in completing the commissioning program. Work schedules, time required for testing, etc., must be requested by the CxA and coordinated by the Contractor. The Contractor must ensure that the qualified technician(s) are available and present during the agreed upon schedules and of sufficient duration to complete the necessary tests, adjustments, and/or problem resolutions.

B. System performance problems and discrepancies may require additional technician time, CxA time, reconstruction of systems, and/or replacement of system components. At no additional cost to the City of New York, the additional technician time must be made available for subsequent commissioning periods until the required system performance is obtained.

C. The CxA reserves the right to question the appropriateness and qualifications of the technicians relative to each item of equipment, system, and/or sub-system. Qualifications of technicians must include expert knowledge relative to the specific equipment involved and a willingness to work with the CxA. The Contractor must provide adequate documentation and tools to start-up and test the equipment, system, and/or sub-system.

3.3. DEFICIENCY RESOLUTION

A. In some systems, inaccurate adjustments, misapplied equipment, and/or deficient performance under varying loads must result in additional work being required to commission the systems. This work must be completed under the direction of the Commissioner, with input from the Contractor, equipment supplier, and CxA. Whereas all members must have input and the opportunity to discuss, debate, and work out problems, the Commissioner must have final jurisdiction over any additional work done to achieve performance.

B. Corrective work must be completed in a timely fashion to permit the completion of the commissioning process. Experimentation to demonstrate system performance may be permitted. If the CxA deems the experimentation work to be ineffective or untimely as it relates to the commissioning process, the CxA must notify the Commissioner, indicating the nature of the problem, expected steps to be taken, and suggested deadline(s) for completion of activities. If the deadline(s) pass without resolution of the problem, the Commissioner reserves the right to obtain supplementary services and/or equipment to resolve the problem. The Contractor must provide supplementary services incurred to solve problems at no additional cost to the City of New York.

3.4. ADDITIONAL COMMISSIONING

A. Additional commissioning activities may be required after system adjustments, replacements, etc., are completed. The contractor(s), suppliers, and CxA must complete this work at no additional cost to the City of New York.

3.5. SUSTAINING SYSTEM READINESS

A. The CxA must prepare and issue to the Contractor Pre-Functional Checklist (PFC) forms for each system or major piece of equipment to be commissioned. Pre-Functional Checklists are important to ensure that the equipment and systems are installed and operational. It ensures that Functional Performance and Integrated Systems Testing may proceed without unnecessary delays. Each piece of equipment is to receive full pre-functional checkout by the Contractor. No sampling strategies are to be used. The Pre-Functional Checklists for all equipment related to any given system must be successfully completed prior to formal Functional Performance and Integrated Systems Testing of the system.

B. The CxA must monitor and track the completion of the Pre-Functional Checklist forms.

The Contractor must complete the Pre-Functional Checklists, provided by the CxA, as follows:

1. Pre-Functional Checklists should be maintained in a binder(s) or electronically at the Contractor's project site office and are subject to review for comparison between the completion level of the Checklists and the status of the work during site observation visits by the CxA.
2. Complete Section 1 "Equipment Delivery" of the Pre-Functional Checklist after equipment delivery to the site.
3. Complete Section 2 "Equipment Installation" of the Pre-Functional Checklist after the equipment installation is complete.
4. Complete Section 3 "Equipment Start-up" of the Pre-Functional Checklist after the equipment has been successfully started. The contractor is to forward copies of all manufacturer's start-up forms and reports to the CxA.
5. Complete Section 4 "Notification for Testing" of the Pre-Functional Checklist after the equipment if fully operational and ready for Functional Performance and Integrated Systems Testing.
6. Completed and signed Pre-Functional Checklists are a pre-requisite for commencing Functional Performance and Integrated Systems Testing. If field observation indicates a significant deviation from actual installation conditions, all checklists must be returned to the Contractor for revision and resubmission at no additional cost to the City.

7. Only individuals that have direct knowledge and witnessed that a line item task on the Pre-Functional Checklist was actually performed must initial or check off that item.

D. The Contractor must clearly list any outstanding items from the Pre-Functional Checklists and/or manufacturer start-up reports and checklists that were not completed successfully in the Comments section of the applicable Pre-Functional Checklist. The CxA must review any items/issues listed and must address them through discussion with the Commissioner and Contractor prior to proceeding with Functional Performance and Integrated Systems Testing.

E. The Contractor must develop detailed start-up plans for all equipment. These plans must be reviewed by the Commissioner and the CxA for completeness and verification that the manufacturer-recommended procedures have been completed.

1. The Contractor responsible for the installation and start-up of the equipment is responsible for developing the start-up plan by combining the Pre-Functional Checklist with the manufacturer's detailed start-up and checkout procedures and any required quality assurance testing.

2. The Contractor must maintain an updated and annotated copy of the start-up plan that must be accessible for review by the Commissioner and the CxA at periodic intervals.

3. The completed start-up procedures must be provided along with the completed Pre-Functional Checklists to the CxA prior to the Contractor's certification that the systems are ready for Functional Performance and Integrated Systems Testing.

3.6. FUNCTIONAL PERFORMANCE TESTING

A. The CxA must provide to the Contractor functional performance tests (FPTs). The Contractor must review the test procedures, so that proper preparation may occur. The Contractor must execute the FPT document and prove to the Commissioner and the CxA that the performance of the Plumbing Systems achieves the performance level identified. Refer to all other specification sections for other systems that may need to be tested. The following systems are to be commissioned but not limited to:

1. Plumbing Systems:

   a. Pumps

   b. Electrical Water Heaters

   c. Expansion Tanks

B. Detailed testing must be performed on all installed equipment and systems to ensure that operation and performance conform to the Contract Documents. All tests must be witnessed by the CxA. The following testing is required as part of the commissioning process:

1. Verification tests are comprised of a full range of checks and tests to determine that all components, equipment, systems, and interfaces between systems operate in accordance with contract documents. This includes all operating modes, interlocks, control responses, and specific responses to abnormal or emergency conditions.

2. Functional performance tests (FPT) must determine if the Fire Suppression system is in accordance with the finalized design intent.

3.7. ROLES AND RESPONSIBILITIES

A. Contractor
   1. Assure acceptable representation, with the means and authority to prepare and coordinate execution of the plumbing system commissioning program as described in the Contract Documents.
   2. Attend commissioning meetings scheduled by the CxA.
   3. Coordinate inclusion of commissioning activities in the construction schedule.
   4. Complete Pre-Functional Checklists and manufacturer's pre-startup checklists prior to scheduling pre-testing of the plumbing system.
   5. Issue a notice that plumbing pre-testing has been scheduled.
   6. Monitor, respond, and remedy deficiencies identified in the Corrective Issue Reports (CIRs) distributed by the CxA in order to expedite corrective actions necessary to achieve design intent.
   7. Facilitate resolution of deficiencies that were identified by observations or performance testing.
   8. Participate in the Functional Performance Tests as required to achieve design intent.
   9. Participate in O&M Instruction as required by DDC General Conditions Section 017900, Demonstration and Owner's Pre-Acceptance Orientation and Section 019113, General Commissioning Requirements for MEP Systems.
   10. Include requirements for submittal data, O&M data, and instruction in each purchase order or sub-contract written.
   11. Ensure participation of major equipment manufacturers in appropriate instruction and testing activities.
   12. Attend Construction Phase coordination meeting scheduled by the CxA.
   13. Assist the CxA in all verification and functional performance tests.
   14. Prepare preliminary schedule and include the following tasks that must be executed: plumbing system orientation and inspections, O&M manual submission, instruction sessions, pipe testing, flushing and cleaning, equipment start-up, and task completion for use by the CxA. Update schedule as appropriate throughout the construction period.
   15. Attend initial instruction session.
   16. Conduct plumbing system orientation and inspection at the equipment placement completion stage.
   17. Update drawings to the record condition to date, and review with the CxA.
   18. Gather O&M data on all equipment and assemble in binders as required by DDC General Conditions Section 017839, Contract Record Documents and Section 019113, General Commissioning Requirements for MEP Systems.
   19. Notify the CxA a minimum of two weeks in advance, so that witnessing equipment and system start-up and testing can begin.
   20. Notify the CxA a minimum of two weeks in advance, of the time for start of the piping tests including pressure / hydrostatic testing.
   21. Participate in and schedule vendors to participate in the instruction sessions.
   22. Provide written notification to the CxA that the following work has been completed in accordance with the Contract Documents, and that the equipment, systems, and sub-systems are operating as required.
      a. Plumbing equipment and all contracted equipment.
      b. Piping test reports including pressure / hydrostatic tests.
      c. Provide a complete set of as-built records to the Commissioning Authority.

3.8. STARTUP

A. The Contractor must follow the start-up and initial checkout procedures listed in this specification and in DDC General Conditions Section 017839, Contract Record Documents and Section 019113, General Commissioning Requirements for MEP Systems. The Division 22 subcontractor, under the direction of the Contractor, has start-up responsibility and is required to complete systems and sub-systems so that they are fully functional and meet the design objectives of the Contract Documents. The commissioning procedures and functional testing do not relieve, lessen this responsibility, or shift that responsibility partially to the CxA or the City of New York.

B. Functional testing is intended to begin upon completion of a system. Functional testing may proceed prior to the completion of systems, or sub-systems at the discretion of the CxA and the Contractor. Beginning system testing before full completion does not relieve the Contractor from fully completing the system, including all Pre-Functional Checklists as soon as possible.

3.9. COMMISSIONING STATUS TRACKING

A. The Contractor must verify that the tag designation as well as the number (count) of each unit listed is correct against those contained within the Contract Documents.

END OF SECTION 22 08 00

SECTION 22 11 13 - FACILITY WATER DISTRIBUTION PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes water-distribution piping and related components outside the building for water service main.

B. Utility-furnished products include water meters that will be furnished to the site, ready for installation.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Detail precast concrete vault assemblies and indicate dimensions, method of field assembly, and components.

C. Field quality-control test reports.

D. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Regulatory Requirements:

1. Comply with requirements of utility company supplying water. Include tapping of water mains and backflow prevention.
2. Comply with requirements of 2014 NYC Plumbing Code for potable-water-service piping, including materials, installation, testing, and disinfection.

3. Comply with standards of 2014 NYC Fire Code for fire-suppression water-service piping, including materials, hose threads, installation, and testing.

C. Piping materials must bear label, stamp, or other markings of specified testing agency.

D. Comply with ASTM F 645 for selection, design, and installation of thermoplastic water piping.

E. Comply with FMG's "Approval Guide" or UL's "Fire Protection Equipment Directory" for fire-service-main products.

F. NFPA Compliance: Comply with NFPA 24-2010 for materials, installations, tests, flushing, and valve and hydrant supervision for fire-service-main piping for fire suppression.

G. Pipes, valves and other materials used in Domestic Water system must be “Lead-Free” certified.

H. NSF Compliance:
1. Comply with NSF 61 for materials for water-service piping and specialties for domestic water.

1.6 PROJECT CONDITIONS

A. Interruption of Existing Water-Distribution Service: Do not interrupt service to facility unless permitted under the following conditions and then only after arranging to provide temporary water-distribution service according to requirements indicated:

1. Notify Commissioner no fewer than five days in advance of proposed interruption of service.
2. Do not proceed with interruption of water-distribution service without Commissioner’s written permission.

1.7 COORDINATION

A. Coordinate connection to water main with utility company.

1.8 WARRANTY

A. Manufacturer must provide products warranty extending 12 months from date of substantial completion.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

A. Soft Copper Tube: “Lead-Free” certified, ASTM B 88, Type K and ASTM B 88, Type L, water tube, annealed temper.

1. Copper, Solder-Joint Fittings: “Lead-Free” certified, ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint pressure type. Furnish only wrought-copper fittings if indicated.

B. Hard Copper Tube: “Lead-Free” certified, ASTM B 88, Type K and ASTM B 88, Type L, water tube, drawn temper.

1. Copper, Solder-Joint Fittings: “Lead-Free” certified, ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint pressure type. Furnish only wrought-copper fittings if indicated.

2.2 JOINING MATERIALS

A. Refer to Division 22 Section 220500 "Common Work Results for Plumbing" for commonly used joining materials.

B. Brazing Filler Metals: AWS A5.8, BCuP Series.

C. Bonding Adhesive for Fiberglass Piping: As recommended by fiberglass piping manufacturer.

D. Plastic Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

2.3 PIPING SPECIALTIES

A. Transition Fittings: Manufactured fitting or coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

B. Tubular-Sleeve Pipe Couplings

1. Description: Metal, bolted, sleeve-type, reducing or transition coupling, with center sleeve, gaskets, end rings, and bolt fasteners and with ends of same sizes as piping to be joined.

a. Standard: AWWA C219.

2.4 GATE VALVES

A. AWWA, Cast-Iron Gate Valves

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American AVK Co.; Valves & Fittings Div.
b. American Cast Iron Pipe Co.; American Flow Control Div.
c. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.
d. Crane Co.; Crane Valve Group; Stockham Div.
e. East Jordan Iron Works, Inc.
f. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).

g. McWane, Inc.; Kennedy Valve Div.
h. McWane, Inc.; M & H Valve Company Div.
i. McWane, Inc.; Tyler Pipe Div.; Utilities Div.
j. Mueller Co.; Water Products Div.
k. NIBCO INC.
l. U.S. Pipe and Foundry Company.
m. Or approved equal.

2. Nonrising-Stem, Metal-Seated Gate Valves

a. Description: Gray- or ductile-iron body and bonnet; with cast-iron or bronze double-disc gate, bronze gate rings, bronze stem, and stem nut.

1) Standard: AWWA C500.
2) Minimum Pressure Rating: 200 psig (1380 kPa).
3) End Connections: Mechanical joint.
4) Interior Coating: Complying with AWWA C550.

3. Nonrising-Stem, Resilient-Seated Gate Valves

a. Description: Gray- or ductile-iron body and bonnet; with bronze or gray- or ductile-iron gate, resilient seats, bronze stem, and stem nut.

1) Standard: AWWA C509.
2) Minimum Pressure Rating: 200 psig (1380 kPa).
3) End Connections: Mechanical joint.
4) Interior Coating: Complying with AWWA C550.

4. Nonrising-Stem, High-Pressure, Resilient-Seated Gate Valves

a. Description: Ductile-iron body and bonnet; with bronze or ductile-iron gate, resilient seats, bronze stem, and stem nut.

1) Standard: AWWA C509.
2) Minimum Pressure Rating: 250 psig (1725 kPa).
3) End Connections: Push on or mechanical joint.
4) Interior Coating: Complying with AWWA C550.

5. OS&Y, Rising-Stem, Metal-Seated Gate Valves

a. Description: Cast- or ductile-iron body and bonnet, with cast-iron double disc, bronze disc and seat rings, and bronze stem.

1) Standard: AWWA C500.
2) Minimum Pressure Rating: 200 psig (1380 kPa).
3) End Connections: Flanged.

6. OS&Y, Rising-Stem, Resilient-Seated Gate Valves

a. Description: Cast- or ductile-iron body and bonnet, with bronze or gray- or ductile-iron gate, resilient seats, and bronze stem.

1) Standard: AWWA C509.
2) Minimum Pressure Rating: 200 psig (1380 kPa).
3) End Connections: Flanged.

B. UL/FMG, Cast-Iron Gate Valves

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Cast Iron Pipe Co.; American Flow Control Div.
b. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.
c. Crane Co.; Crane Valve Group; Stockham Div.
d. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
e. McWane, Inc.; Kennedy Valve Div.
f. McWane, Inc.; M & H Valve Company Div.
g. Mueller Co.; Water Products Div.
h. NIBCO INC.
i. U.S. Pipe and Foundry Company.
j. Or approved equal.

2. UL/FMG, Nonrising-Stem Gate Valves

a. Description: Iron body and bonnet with flange for indicator post, bronze seating material, and inside screw.

1) Standards: UL 262 and FMG approved.
2) Minimum Pressure Rating: 175 psig (1207 kPa).
3) End Connections: Flanged.

3. OS&Y, Rising-Stem Gate Valves

a. Description: Iron body and bonnet and bronze seating material.

1) Standards: UL 262 and FMG approved.
2) Minimum Pressure Rating: 175 psig (1207 kPa).
3) End Connections: Flanged.

C. Bronze Gate Valves

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Co.; Crane Valve Group; Crane Valves.
b. Crane Co.; Crane Valve Group; Jenkins Valves.
c. Crane Co.; Crane Valve Group; Stockham Div.
d. Hammond Valve.
e. Milwaukee Valve Company.
f. NIBCO INC.

g. Red-White Valve Corporation.
h. Or approved equal.

2. OS&Y, Rising-Stem Gate Valves

a. Description: Bronze body and bonnet and bronze stem.

1) Standards: UL 262 and FMG approved.
2) Minimum Pressure Rating: 175 psig (1207 kPa).
3) End Connections: Threaded.

3. Nonrising-Stem Gate Valves

a. Description: Class 125, Type 1, bronze with solid wedge, threaded ends, and malleable-iron handwheel.

1) Standard: MSS SP-80.

2.5 GATE VALVE ACCESSORIES AND SPECIALTIES

A. Tapping-Sleeve Assemblies:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.
b. East Jordan Iron Works, Inc.
c. Flowserve.
d. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
e. McWane, Inc.; Kennedy Valve Div.
f. McWane, Inc.; M & H Valve Company Div.
g. Mueller Co.; Water Products Div.
h. U.S. Pipe and Foundry Company.
i. Or approved equal.

2. Description: Sleeve and valve compatible with drilling machine.

a. Standard: MSS SP-60.
b. Tapping Sleeve: Cast- or ductile-iron or stainless-steel, two-piece bolted sleeve with flanged outlet for new branch connection. Include sleeve matching size and type of pipe material being tapped and with recessed flange for branch valve.
c. Valve: AWWA, cast-iron, nonrising-stem, resilient-seated gate valve with one raised face flange mating tapping-sleeve flange.

B. Valve Boxes: Comply with AWWA M44 for cast-iron valve boxes. Include top section, adjustable extension of length required for depth of burial of valve, plug with lettering "WATER," and bottom section with base that fits over valve and with a barrel approximately 5 inches (125 mm) in diameter.

1. Operating Wrenches: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and socket matching valve operating nut.

C. Indicator Posts: UL 789, FMG-approved, vertical-type, cast-iron body with operating wrench, extension rod, and adjustable cast-iron barrel of length required for depth of burial of valve.

2.6 CORPORATION VALVES AND CURB VALVES.

A. Manufacturers

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Amcast Industrial Corporation; Lee Brass Co.
b. Ford Meter Box Company, Inc. (The); Pipe Products Div.
c. Jones, James Company.
d. Master Meter, Inc.
e. McDonald, A. Y. Mfg. Co.
f. Mueller Co.; Water Products Div.
g. Red Hed Manufacturing & Supply.
h. Or approved equal.

B. Service-Saddle Assemblies: Comply with AWWA C800. Include saddle and valve compatible with tapping machine.

1. Service Saddle: Copper alloy with seal and AWWA C800, threaded outlet for corporation valve.
2. Corporation Valve: Bronze body and ground-key plug, with AWWA C800, threaded inlet and outlet matching service piping material.
3. Manifold: Copper fitting with two to four inlets as required, with ends matching corporation valves and outlet matching service piping material.

C. Curb Valves: Comply with AWWA C800. Include bronze body, ground-key plug or ball, and wide tee head, with inlet and outlet matching service piping material.

D. Service Boxes for Curb Valves: Similar to AWWA M44 requirements for cast-iron valve boxes. Include cast-iron telescoping top section of length required for depth of burial of valve, plug with lettering "WATER," and bottom section with base that fits over curb valve and with a barrel approximately 3 inches (75 mm) in diameter.

1. Shutoff Rods: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and slotted end matching curb valve.

2.7 WATER METERS

A. Manufacturers:

1. Basis-of-Design Product: Subject to compliance with requirements, provide NYC DEP water meter Elster (Amco) evoQ4 Electronic or a comparable product by one of the following:

   a. Badger Recordall, Model EnviroBrass II.
   b. Sensus Accustream, ECR.
   c. Metron-Farnier Spectrum, Inno 8.
   d. Or approved equal.

B. Single Jet or Electromagnetic Water Meters

1. Description: With bronze main case.

   a. Standard: AWWA C700.
   b. Registration: Flow in gallons (liters) and cubic feet (cubic meters).

C. Provide NYC DEP approved strainer.

D. Provide meter with provision for AMR system and with remote reading device located on the exterior of the building. Remote reading pad location must be coordinated with Commissioner.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PIPING APPLICATIONS

A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications.

B. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used, unless otherwise indicated.

C. Do not use flanges or unions for underground piping.

D. Flanges, unions, and special fittings may be used, instead of joints indicated, on aboveground piping and piping in vaults.

E. Underground water-service piping NPS 2 (DN 50) the following:

1. Hard Copper Tube: “Lead-Free” certified, ASTM B 88, Type K water tube, drawn temper.

2. Copper, Solder-Joint Fittings: “Lead-Free” certified, ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint pressure type. Furnish only wrought-copper fittings if indicated.

F. Above ground water-service piping NPS 2 (DN 50) the following:

1. Hard Copper Tube: “Lead-Free” certified, ASTM B 88, Type L water tube, drawn temper.

2. Copper, Solder-Joint Fittings: “Lead-Free” certified, ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint pressure type. Furnish only wrought-copper fittings if indicated.

3.3 VALVE APPLICATIONS

A. General Application: Use mechanical-joint-end valves for NPS 3 (DN 80) and larger underground installation. Use threaded- or flanged-end valves for installation in vaults. Use UL/FMG, nonrising-stem gate valves for installation with indicator posts. Use corporation valves and curb valves with ends compatible with piping, for NPS 2 (DN 50) and smaller installation.

B. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

1. Underground pipes, NPS 2 and smaller: Full port ball valve or non-rising stem gate valve rated for 150 psi of working pressure.
2. Underground Valves, NPS 3 and Larger: AWWA, cast-iron, non-rising-stem, resilient-seated gate valves with valve box.
3. Underground Valves, NPS 4 and Larger, for Indicator Posts: UL/FMG, cast-iron, nonrising-stem gate valves with indicator post.
4. Use the following for valves in vaults and aboveground:

   a. Gate Valves, NPS 2 and Smaller: Bronze, nonrising stem.
   b. Gate Valves, NPS 3 and Larger: AWWA, UL/FMG, cast iron, OS&Y rising stem.

3.4 PIPING SYSTEMS - COMMON REQUIREMENTS

A. See Section 220500 "Common Work Results for Plumbing" for piping-system common requirements.

3.5 PIPING INSTALLATION

A. Water-Main Connection: Arrange with utility company for tap of size and in location indicated in water main.

B. Make connections larger than NPS 2 with tapping machine according to the following:

1. Install tapping sleeve and tapping valve according to MSS SP-60.
2. Install tapping sleeve on pipe to be tapped. Position flanged outlet for gate valve.
3. Use tapping machine compatible with valve and tapping sleeve; cut hole in main. Remove tapping machine and connect water-service piping.
4. Install gate valve onto tapping sleeve. Comply with MSS SP-60. Install valve with stem pointing up and with valve box.

C. Make connections NPS 2 and smaller with drilling machine according to the following:

1. Install service-saddle assemblies and corporation valves in size, quantity, and arrangement required by utility company standards.
2. Install service-saddle assemblies on water-service pipe to be tapped. Position outlets for corporation valves.
3. Use drilling machine compatible with service-saddle assemblies and corporation valves. Drill hole in main. Remove drilling machine and connect water-service piping.
4. Install corporation valves into service-saddle assemblies.
5. Install manifold for multiple taps in water main.
6. Install curb valve in water-service piping with head pointing up and with service box.

D. Comply with NFPA 24, 2010 for fire-service-main piping materials and installation.

1. Install copper tube and fittings according to CDA's "Copper Tube Handbook."

E. Install ductile-iron, water-service piping according to AWWA C600 and AWWA M41.

F. Bury piping with depth of cover over top at least 12 inches below level of maximum frost penetration.

G. Extend water-service piping and connect to water-supply source and building-water-piping systems at outside face of building wall in locations and pipe sizes indicated.

1. Terminate water-service piping at building wall until building-water-piping systems are installed. Terminate piping with caps, plugs, or flanges as required for piping material. Make connections to building-water-piping systems when those systems are installed.

H. Sleeves are specified in Section 220500 "Common Work Results for Plumbing."

I. Mechanical sleeve seals are specified in Section 220500 "Common Work Results for Plumbing."

J. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports.

3.6 JOINT CONSTRUCTION

A. See Section 220500 "Common Work Results for Plumbing" for basic piping joint construction.

B. Make pipe joints according to the following:

1. Ductile-Iron Piping, Gasketed Joints for Water-Service Piping: AWWA C600 and AWWA M41.
2. Ductile-Iron Piping, Gasketed Joints for Fire-Service-Main Piping: UL 194.
3. Ductile-Iron Piping, Grooved Joints: Cut-groove pipe. Assemble joints with grooved-end, ductile-iron-piping couplings, gaskets, lubricant, and bolts according to coupling manufacturer's written instructions.
4. Dissimilar Materials Piping Joints: Use adapters compatible with both piping materials, with OD, and with system working pressure. Refer to Section 220500 "Common Work Results for Plumbing" for joining piping of dissimilar metals.

3.7 ANCHORAGE INSTALLATION

A. Anchorage, General: Install water-distribution piping with restrained joints. Anchorages and restrained-joint types that may be used include the following:

1. Concrete thrust blocks.
2. Locking mechanical joints.
3. Set-screw mechanical retainer glands.
4. Bolted flanged joints.
5. Heat-fused joints.
6. Pipe clamps and tie rods.

B. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:

1. Gasketed-Joint, Ductile-Iron, Water-Service Piping: According to AWWA C600.
2. Gasketed-Joint, PVC Water-Service Piping: According to AWWA M23.
3. Fire-Service-Main Piping: According to NFPA 24.

C. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

3.8 VALVE INSTALLATION

A. AWWA Gate Valves: Comply with AWWA C600 and AWWA M44. Install each underground valve with stem pointing up and with valve box.

B. UL/FMG, Gate Valves: Comply with NFPA 24. Install each underground valve and valves in vaults with stem pointing up and with vertical cast-iron indicator post.

C. MSS Valves: Install as component of connected piping system.

D. Corporation Valves and Curb Valves: Install each underground curb valve with head pointed up and with service box.

3.9 WATER METER INSTALLATION

A. Install water meters, piping, and specialties according to utility company's written instructions.

3.10 CONNECTIONS

A. Piping installation requirements are specified in Section 221116 “Domestic Water Piping”. Drawings indicate general arrangement of piping, fittings, and specialties.

B. See Section 220500 "Common Work Results for Plumbing" for piping connections to valves and equipment.

C. Connect water-distribution piping to utility water main. Use tapping sleeve and tapping valve.

D. Connect water-distribution piping to interior domestic water and fire-suppression piping.

3.11 FIELD QUALITY CONTROL

A. Piping Tests: Conduct piping tests before joints are covered and after concrete thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.

B. Hydrostatic Tests: Test at not less than one-and-one-half times working pressure for two hours.

1. Increase pressure in 50-psig (350-kPa) increments and inspect each joint between increments. Hold at test pressure for 1 hour; decrease to 0 psig (0 kPa). Slowly increase again to test pressure and hold for 1 more hour. Maximum allowable leakage is 2 quarts (1.89 L) per hour per 100 joints. Remake leaking joints with new materials and repeat test until leakage is within allowed limits.

C. Prepare reports of testing activities.

3.12 IDENTIFICATION

A. Install continuous underground detectable warning tape during backfilling of trench for underground water-distribution piping. Locate below finished grade, directly over piping.

B. Permanently attach equipment nameplate or marker indicating plastic water-service piping, on main electrical meter panel. See Section 220553 "Identification for Plumbing Piping and Equipment" for identifying devices.

3.13 CLEANING

A. Clean and disinfect water-distribution piping as follows:

1. Purge new water-distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
2. Use purging and disinfecting procedure described in AWWA C651 or do as follows:

a. Fill system or part of system with water/chlorine solution containing at least 50 ppm of chlorine; isolate and allow to stand for 24 hours.
b. Drain system or part of system of previous solution and refill with water/chlorine solution containing at least 200 ppm of chlorine; isolate and allow to stand for 3 hours.
c. After standing time, flush system with clean, potable water until no chlorine remains in water coming from system.
d. Repeat procedure if biological examination shows evidence of contamination.

B. Prepare reports of purging and disinfecting activities.

END OF SECTION 22 11 13

SECTION 22 11 16 - DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes domestic water piping inside the building.

B. Related Sections

1. Section 220523 "General-Duty Valves for Plumbing Piping" for valves.
2. Section 221113 "Facility Water Distribution Piping" for exterior pipes and water meter.
3. Section 221119 "Domestic Water Piping Specialties" for plumbing specialties.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Field quality-control test reports.

B. Materials.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Comply with NSF 14, "Plastics Piping System Components and Related Materials," for plastic, potable domestic water piping and components.

C. “LEAD-FREE” Certification: copper pipes and other materials used in domestic water cold and hot water systems shall be “LEAD-FREE” certified.

D. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9," for potable domestic water piping and components.

1.6 WARRANTY

A. Manufacturer must provide products warranty extending 12 months from date of substantial completion.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

A. Refer to Part 3 "Pipe and Fitting Applications" Article for applications of pipe, tube, fitting, and joining materials.

B. Transition Couplings for Aboveground Pressure Piping: Coupling or other manufactured fitting the same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

C. Soft Copper Tube: “LEAD-FREE” certified, ASTM B 88, Types K and L, M, water tube, annealed temper.

1. Copper Pressure Fittings: “LEAD-FREE” certified, ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint fittings. Furnish wrought-copper fittings if indicated.
2. Bronze Flanges: “LEAD-FREE” certified, ASME B16.24, Class 150, with solder-joint ends. Furnish Class 300 flanges if required to match piping.
3. Copper Unions: “LEAD-FREE” certified, MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.

D. Hard Copper Tube: “LEAD-FREE” certified, ASTM B 88, Types L and M (ASTM B 88M, Types B and C), water tube, drawn temper.

1. Copper Pressure Fittings: “LEAD-FREE” certified, ASME B16.18, cast-copper-alloy or ASME B16.22, wrought- copper, solder-joint fittings. Furnish wrought-copper fittings if indicated.
2. Bronze Flanges: “LEAD-FREE” certified, ASME B16.24, Class 150, with solder-joint ends. Furnish Class 300 flanges if required to match piping.
3. Copper Unions: “LEAD-FREE” certified, MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.

2.2 VALVES

A. Bronze and cast-iron, general-duty valves are specified in Section 220523 "General-Duty Valves for Plumbing Piping."

B. Balancing and drain valves are specified in Section 221119 "Domestic Water Piping Specialties."

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PIPE AND FITTING APPLICATIONS

A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below, unless otherwise indicated.

B. Flanges may be used on aboveground piping, unless otherwise indicated.

C. Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing.

D. Under-Building-Slab, Water-Service Piping on Service Side of Water Meter: Refer to Section 221113 "Facility Water Distribution Piping."

E. Domestic Water Piping on Service Side of Water Meter inside the Building: Use the following piping materials for each size range:

1. NPS 2: Hard copper tube, Type K; copper pressure fittings; and brazed joints.

F. Under-Building-Slab, Domestic Water Piping on House Side of Water Meter, NPS 4 (DN 100) and Smaller: Hard copper tube, Type K; brazed joints.

G. Aboveground Domestic Water Piping: Use any of the following piping materials for each size range:

1. NPS 1 and Smaller: Hard copper tube, Type L; copper pressure fittings; and soldered joints.
2. NPS 1-1/4 and NPS 1-1/2 Hard copper tube, Type L; copper pressure fittings; and soldered joints.
3. NPS 2: Hard copper tube, Type L; copper pressure fittings; and brazed joints.

3.3 VALVE APPLICATIONS

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

1. Shutoff Duty: Use bronze ball or gate valves for piping NPS 2 and smaller. Use cast-iron gate valves with flanged ends for piping NPS 2-1/2 and larger.
2. Throttling Duty: Use bronze ball or globe valves for piping NPS 2 and smaller. Use cast-iron butterfly valves with flanged ends for piping NPS 2-1/2 and larger.
3. Hot-Water-Piping, Balancing Duty: Memory-stop balancing valves.
4. Drain Duty: Hose-end drain valves.

B. Install shutoff valve close to water main on each branch and riser serving plumbing fixtures or equipment, on each water supply to equipment, and on each water supply to plumbing fixtures that do not have supply stops. Use ball or gate valves for piping NPS 2 and smaller. Use butterfly or gate valves for piping NPS 2-1/2 and larger.

C. Install drain valves for equipment at base of each water riser, at low points in horizontal piping, and where required to drain water piping.
   1. Install hose-end drain valves at low points in water mains, risers, and branches.
   2. Install stop-and-waste drain valves where indicated.

D. Install balancing valve in each hot-water circulation return branch and discharge side of each pump and circulator. Set balancing valves partly open to restrict but not stop flow. Use ball valves for piping NPS 2 and smaller and butterfly valves for piping NPS 2-1/2 and larger. Balancing valves are specified in Section 221119 "Domestic Water Piping Specialties."

E. Install calibrated balancing valves in each hot-water circulation return branch and discharge side of each pump and circulator. Set calibrated balancing valves partly open to restrict but not stop flow. Calibrated balancing valves are specified in Section 221119 "Domestic Water Piping Specialties."

3.4 PIPING INSTALLATION

A. Basic piping installation requirements are specified in Section 220500 "Common Work Results for Plumbing."

B. Install under-building-slab copper tubing according to CDA's "Copper Tube Handbook."

C. Install cast-iron or steel sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Sleeves and mechanical sleeve seals are specified in Section 220500 "Common Work Results for Plumbing."

D. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve, inside the building at each domestic water service entrance. Pressure gages and strainers are specified in Section 221119 "Domestic Water Piping Specialties".

E. Install domestic water piping level without pitch and plumb.

F. Rough-in domestic water piping for water-meter installation according to utility company's requirements.

3.5 JOINT CONSTRUCTION

A. Basic piping joint construction requirements are specified in Section 220500 "Common Work Results for Plumbing."

B. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.

C. Extruded-Tee Connections: Form tee in copper tube according to ASTM F 2014. Use tool designed for copper tube; drill pilot hole, form collar for outlet, dimple tube to form seating stop, and braze branch tube into collar.

3.6 ROUGHING-IN FOR WATER METERS

A. Rough-in domestic water piping for water meter installation according to utility company's requirements.

B. Water meters shall be provided as specified in Section 221113 “Facility Water Distribution Piping”.

3.7 HANGER AND SUPPORT INSTALLATION

A. Pipe hanger and support devices are specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment." Install the following:

1. Vertical Piping: MSS Type 8 or Type 42, clamps.
2. Individual, Straight, Horizontal Piping Runs: According to the following:
   a. 100 Feet (30 m) and Less: MSS Type 1, adjustable, steel clevis hangers.
   b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
4. Base of Vertical Piping: MSS Type 52, spring hangers.

B. Install supports according to Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."

C. Support vertical piping and tubing at base and at each floor.

D. Rod diameter may be reduced 1 size for double-rod hangers, to a minimum of 3/8 inch.

E. Install supports for vertical steel piping every 15 feet.

F. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 3/4 and Smaller: 60 inches with 3/8-inch rod.
2. NPS 1 and NPS 1-1/4: 72 inches with 3/8-inch rod.
3. NPS 1-1/2 and NPS 2 : 96 inches with 3/8-inch rod.
4. NPS 2-1/2: 108 inches with 1/2-inch rod.
5. NPS 3 to NPS 5: 10 feet with 1/2-inch rod.

G. Install supports for vertical copper tubing every 10 feet.

H. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.8 CONNECTIONS

A. Install piping adjacent to equipment and machines to allow service and maintenance.

B. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.

C. Connect domestic water piping to water-service piping with shutoff valve, and extend and connect to the following:

1. Booster Pumps: Cold-water suction and discharge piping.
2. Water Heaters: Cold-water supply and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.
3. Plumbing Fixtures: Cold- and hot-water supply piping in sizes indicated, but not smaller than required by NYC Plumbing Code 2014. Refer to Division 22 Section 224000 "Plumbing Fixtures."
4. Equipment: Cold- and hot-water supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 and larger.

3.9 FIELD QUALITY CONTROL

A. Inspect domestic water piping as follows:

1. Do not enclose, cover, or put piping into operation until it has been inspected and approved by Commissioner.
2. During installation, notify Commissioner at least 24 hours before inspection must be made. Perform tests specified below in presence of Commissioner.
   a. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
   b. Final Inspection: Arrange final inspection for Commissioner to observe tests specified below and to ensure compliance with requirements.
3. Re-inspection: If the Commissioner finds that piping will not pass test or inspection, make required corrections and arrange for re-inspection.
4. Reports: Prepare inspection reports and have them signed by Commissioner.

B. Test domestic water piping as follows:

1. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
2. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
3. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
4. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
5. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.

6. Prepare reports for tests and required corrective action.

3.10 CLEANING

A. Clean and disinfect potable domestic water piping using purging and disinfecting procedures prescribed by Commissioner.

B. Submit water samples in sterile bottles to the Commissioner. Repeat procedures if biological examination shows contamination.

C. Prepare and submit reports of purging and disinfecting activities.

END OF SECTION 22 11 16

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 22 11 19 - DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes:

1. Vacuum breakers.
2. Backflow preventers.
3. Balancing valves.
4. Temperature-actuated water mixing valves.
5. Hose bibbs.
6. Wall hydrants.
7. Drain valves.
8. Water hammer arresters.
9. Trap-seal primer valves.
10. Water Sub-Meters.

B. Related Sections

C. Section 221113 "Facility Storm Drainage Piping" for water meters.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Field quality-control test reports.

C. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. NSF Compliance:
1. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic domestic water piping components.

2. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9."

1.6 PERFORMANCE REQUIREMENTS

A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig (860 kPa), unless otherwise indicated.

1.7 WARRANTY

A. Manufacturer must provide products warranty extending 12 months from date of substantial completion.

PART 2 - PRODUCTS

2.1 VACUUM BREAKERS

A. Pipe-Applied, Pressure-Type, Spill-Resistant Vacuum Breakers:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Anti-Siphon Pressure Vacuum Breaker Watts Model LF008CQT-SC or comparable product by one of the following:
   a. Ames Co.
   b. Cash Acme.
   c. Conbraco Industries, Inc.
   d. FEBCO; SPX Valves & Controls.
   e. Zurn Plumbing Products Group; Wilkins Div.
   f. Or approved equal.
2. Standard: ASSE 1001.
3. “LEAD-FREE” Certification: Required
4. Size: NPS 1/4 to NPS 3 (DN 8 to DN 80), as required to match connected piping.
5. Body: Bronze.
6. Inlet and Outlet Connections: Threaded.
7. Finish: Chrome plated.

B. Hose-Connection Vacuum Breakers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Arrowhead Brass Products, Inc.
   b. Cash Acme.
   c. Conbraco Industries, Inc.
   d. Legend Valve.
   e. MIFAB, Inc.
   f. Prier Products, Inc.
   g. Watts Industries, Inc.; Water Products Div.
   h. Woodford Manufacturing Company.

i. Zurn Plumbing Products Group; Light Commercial Operation.
j. Zurn Plumbing Products Group; Wilkins Div.
k. Or approved equal.

2. Standard: ASSE 1001.
3. "LEAD-FREE" Certification: Required
4. Body: Bronze, nonremovable, with manual drain.
5. Outlet Connection: Garden-hose threaded complying with ASME B1.20.7.
6. Finish: Chrome or nickel plated.

2.2 BACKFLOW PREVENTERS

A. Reduced-Pressure-Principal Backflow Preventers (RPZ):

1. Basis -of Design Product: Subject to compliance with requirements, provide "LEAD-FREE" certified, backflow preventer Wilkins Model 975XL2 as indicated on DEP approved application for backflow preventers or comparable product by one of the following.
   a. Watts Model U919QT.
   b. Febco Model LF825Y.
   c. AMES Model U400B
   d. Or approved equal.
2. Device must be installed as per NYC DEP Cross-Connection requirements and in compliance with approved application. Device must be provided with air gap fitting and integral Relief monitoring switch. All deviations from the approved application must be brought to the attention of Commissioner prior to the installation. Device must be provided with Flood Control System consisting of Solenoid Control Valve and Controller.
3. Standard: ASSE 1013.
4. "LEAD-FREE" Certification: Required
5. Operation: Continuous-pressure applications.
6. Pressure Loss: 13 psig (83 kPa) maximum, through middle 1/3 of flow range.
7. Size: 2".
8. Body: Cast Bronze.
9. End Connections: Threaded.
10. Configuration: Designed for horizontal, straight through flow.
11. Accessories:
    a. Valves: Full port ball valves.
    b. Air-Gap Fitting: ASME A112.1.2, matching backflow-preventer connection.
    c. Integral Relief Valve Monitoring Switch with dry contact to transmit signal to remote location.
    d. Alarm Signal must be transmitted to BMS.

B. Backflow-Preventer Test Kits:

1. Basis -of Design Product: Subject to compliance with requirements, provide backflow preventer test kit must be from same manufacturer as backflow preventer or comparable product by one of the following.

   a. Watts Model TK-99E.
   b. Zurn TG-5.

c. Febco TK1.
d. Or approved equal.

2. Description: Factory calibrated, with gages, fittings, hoses, and carrying case with test-procedure instructions.

2.3 BALANCING VALVES

A. Memory-Stop Balancing Valves:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Memory-Stop Balancing Valves, Watts Model LFCSM-61-S or comparable product by one of the following:

a. Conbraco Industries, Inc.
b. Crane Co.; Crane Valve Group; Crane Valves.
c. Milwaukee Valve Company.
d. NIBCO INC.
e. Red-White Valve Corp.
f. Or approved equal.

2. Standard: MSS SP-110 for two-piece, copper-alloy ball valves.
3. "LEAD-FREE" Certification: Required
4. Pressure Rating: 400-psig (2760-kPa) minimum CWP.
5. Size: NPS 2 (DN 50) or smaller.
6. Body: Brass or Copper alloy.
7. Port: Standard or full port.
8. Ball: Chrome-plated brass.
9. Seats and Seals: Replaceable.
10. End Connections: Solder joint or threaded.
11. Handle: Vinyl-covered steel with memory-setting device.

2.4 TEMPERATURE-ACTUATED WATER MIXING VALVES

A. Primary, Thermostatic, Water Mixing Valves:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Thermostatic Mixing Valve Leonard TM-26-LF-BDT, HOLBY Valve or comparable product by one of the following:

a. Armstrong International, Inc.
b. Lawler Manufacturing Company, Inc. (Model 801)
c. Leonard Valve Company.
d. Powers; a Watts Industries Co.
e. Simmons Industries, Inc.
f. Or approved equal.

2. Standard: ASSE 1017.
3. "LEAD-FREE" Certification: Required
4. Pressure Rating: 125 psig (860 kPa).

5. Type: Exposed-mounting, thermostatically controlled water mixing valve.
6. Material: Bronze body with corrosion-resistant interior components.
7. Connections: Union inlets and outlet.
8. Accessories: Manual temperature control, check stops on hot- and cold-water supplies, and adjustable, temperature-control handle; thermometer.
9. Valve Pressure Rating: 125 psig (860 kPa) minimum, unless otherwise indicated.
10. Tempered-Water Setting: 110 deg F.
11. Tempered-Water Design Flow Rates: Varies.
12. Valve Finish: Rough bronze.
13. Piping Finish: Copper.

2.5 HOSE BIBB:

A. Basis-of-Design Product: Subject to compliance with requirements, provide Woodford Model 24 or comparable product by one of the following manufacturers:

1. Granger (Model 108)
2. ProFlor Model 74
3. Leonard.
4. Armstrong.
5. Woodford.
6. Or approved equal.

B. Standard: ASSE 1011.

C. Body Material: Bronze.

D. Seat: Bronze, replaceable.

E. Supply Connections: NPS 1/2 or NPS 3/4 (DN 15 or DN 20) threaded or solder-joint inlet.

F. Outlet Connection: Garden-hose thread complying with ASME B1.20.7.

G. Pressure Rating: 125 psig (860 kPa).

H. Vacuum Breaker: Integral, nonremovable, drainable, hose-connection vacuum breaker complying with ASSE 1011.

I. Finish for Equipment Rooms: Rough bronze, or chrome or nickel plated.

J. Finish for Service Areas: Rough bronze.

K. Finish for Finished Rooms: Chrome or nickel plated.

L. Operation for Equipment Rooms: Wheel handle or operating key.

M. Operation for Service Areas: Wheel handle.

N. Operation for Finished Rooms: Operating key.

O. Include operating key with each operating-key hose bibb.

P. Include wall flange with each chrome- or nickel-plated hose bibb.

2.6 WALL HYDRANTS

A. Non-freeze Wall Hydrants WH:

1. Basis-of-Design Product: Subject to compliance with requirements, J.R. Smith Model 5619QT-WC, Zurn Model 1321 or comparable product by one of the following:

   a. Zurn (Model 1321)
   b. Watts (HY 420)
   c. Josam Company.
   d. MIFAB, Inc.
   e. Watts Drainage Products Inc.
   f. Or approved equal.

2. Non-freeze wall hydrants must be: Bronze nickel-plated quarter turn non-freeze hydrant with hose connection, integral vacuum breaker, “T” handle key, adjustable wall clamp and backer plate
3. Standard: ASME A112.21.3M for concealed-outlet, self-draining wall hydrants.
4. Pressure Rating: 125 psig (860 kPa).
5. Operation: Loose key.
6. Casing and Operating Rod: Of length required to match wall thickness. Include wall clamp.
7. Inlet: NPS 3/4 (DN 20).
8. Outlet: Concealed, with integral vacuum breaker and garden-hose thread complying with ASME B1.20.7.
9. Box: n/a
10. Backer Plate Finish: Chrome Plated.
11. Outlet: Concealed, with integral vacuum breaker and garden-hose thread complying with ASME B1.20.7.
12. Nozzle and Wall-Plate Finish: Nickel bronze.
13. Operating Keys(s): Two with each wall hydrant.
14. Vacuum breaker: Integrated

2.7 DRAIN VALVES

A. Ball-Valve-Type, Hose-End Drain Valves:

1. Standard: MSS SP-110 for standard-port, two-piece ball valves.
2. Pressure Rating: 400-psig (2760-kPa) minimum CWP.
3. Size: NPS 3/4 (DN 20).
4. Body: Copper alloy.
5. Ball: Chrome-plated brass.
6. Seats and Seals: Replaceable.
7. Handle: Vinyl-covered steel.
8. Inlet: Threaded or solder joint.

9. Outlet: Threaded, short nipple with garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

2.8 WATER HAMMER ARRESTERS

A. Water Hammer Arresters:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. AMTROL, Inc.
   b. Josam Company.
   c. MIFAB, Inc.
   d. PPP Inc.
   e. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
   f. Tyler Pipe; Wade Div.
   g. Watts Drainage Products Inc.
   h. Zurn Plumbing Products Group; Specification Drainage Operation.
   i. Or approved equal.

2. Standard: ASSE 1010 or PDI-WH 201.
3. "LEAD-FREE" Certification: Required
4. Type: Copper tube with piston.
5. Size: ASSE 1010, Sizes AA and A through F or PDI-WH 201, Sizes A through F.

2.9 TRAP PRIMER

A. Basis-of-Design Product: Subject to compliance with requirements, Zurn Model Z1020XL-5 or comparable product by one of the following:

1. PPP Inc. (Model MBP-500-115V)
2. Precision Products
3. Sioux Chief (Model 695-ES01)
4. Or approved equal.

B. Mini-primer electronic trap primer, with distribution unit for four connections.

C. Trap primer must be installed in accordance with manufacturer's recommendations.

2.10 WATER SUB-METER

A. Basis-of-Design Product: Subject to compliance with requirements, provide NYC DEP water meter Metron-Farnier Spectrum, Inno 8 with wireless antenna/ dual register or a comparable product by one of the following:
1. Badger Recordall, Model EnviroBrass II.
2. Sensus Accustream, ECR.
3. Elster (Amco) evoQ4.
4. Or approved equal.

B. Register must be in gallons and cubic feet.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Refer to Section 220500 "Common Work Results for Plumbing" for piping joining materials, joint construction, and basic installation requirements.

B. Install backflow preventers in each water supply to mechanical equipment and systems and to other equipment and water systems that may be sources of contamination. Comply with following requirements and NYC Department of Environmental Protection.

1. Locate backflow preventers in same room as connected equipment or system.
2. Install drain for backflow preventers with atmospheric-vent drain connection with air-gap fitting, fixed air-gap fitting, or equivalent positive pipe separation of at least two pipe diameters in drain piping and pipe to floor drain. Locate air-gap device attached to or under backflow preventer. Simple air breaks are not acceptable for this application.
3. Do not install bypass piping around backflow preventers.

C. Install water regulators with inlet and outlet shutoff valves and bypass with memory-stop balancing valve. Install pressure gages on inlet and outlet.

D. Install balancing valves in locations where they can easily be adjusted.

E. Install temperature-actuated water mixing valves with check stops or shutoff valves on inlets and with shutoff valve on outlet.

1. Install thermometers and water regulators if specified.
2. Install cabinet-type units recessed in or surface mounted on wall as specified.

F. Install water hammer arresters in water piping according to PDI-WH 201.

G. Install supply-type, trap-seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.

H. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping and specialties.

I. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:

1. Intermediate atmospheric-vent backflow preventers.
2. Reduced-pressure-principal backflow preventers.
3. Double-check backflow-prevention assemblies.
4. Water pressure-reducing valves.

5. Primary, thermostatic, water mixing valves.
6. Supply-type, trap-seal primer valves.

J. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Division 22 Section 220553 "Identification for Plumbing Piping and Equipment."

3.3 FIELD QUALITY CONTROL

A. Perform the following tests and prepare test reports:

1. Test each reduced-pressure-principal backflow preventer and double-check backflow-prevention assembly according to NYC DEP and the device's reference standard. Generate test report and submit to DEP.

B. Remove and replace malfunctioning domestic water piping specialties and retest as specified above.

3.4 ADJUSTING

A. Set field-adjustable pressure set points of water pressure-reducing valves.

B. Set field-adjustable flow of balancing valves.

C. Set field-adjustable temperature set points of temperature-actuated water mixing valves.

END OF SECTION 22 11 19

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 22 13 16 - SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes the following soil and waste, sanitary drainage, and vent piping inside the building:

1. Pipe, tube, and fittings.
2. Special pipe fittings.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Field quality-control inspection and test reports.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Piping materials must bear label, stamp, or other markings of specified testing agency.

C. Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-DWV" for plastic drain, waste, and vent piping; and "NSF-drain" for plastic drain piping.

1.6 PERFORMANCE REQUIREMENTS

A. Components and installation must be capable of withstanding the following minimum working pressure, unless otherwise indicated:

1. Soil, Waste, and Vent Piping: 10-foot head of water.

1.7 WARRANTY

A. Manufacturer must provide product warranty extending 12 months from date of substantial completion.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

A. Hub-and-Spigot, Cast-Iron Pipe and Fittings: ASTM A 74, Extra Heavy Class.

1. Gaskets: ASTM C 564, rubber.

B. Hubless Cast-Iron Pipe and Fittings: ASTM A 888 or CISPI 301.

1. Sovent Stack Fittings: ASME B16.45 or ASSE 1043, hubless, cast-iron aerator and deaerator drainage fittings.
2. Shielded Couplings: ASTM C 1277 assembly of metal shield or housing, corrosion-resistant fasteners, and rubber sleeve with integral, center pipe stop.

a. Standard, Shielded, Stainless-Steel Couplings: CISPI 310, with stainless-steel corrugated shield; stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve.

C. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade A or B, Schedule 40, galvanized. Include ends matching joining method.

1. Drainage Fittings: ASME B16.12, galvanized, threaded, cast-iron drainage pattern.
2. Pressure Fittings:

a. Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M or ASTM A 106, Schedule 40, galvanized, seamless steel pipe. Include ends matching joining method.
b. Malleable-Iron Unions: ASME B16.39; Class 150; hexagonal-stock body with ball-and-socket, metal-to-metal, bronze seating surface; and female threaded ends.
c. Gray-Iron, Threaded Fittings: ASME B16.4, Class 125, galvanized, standard pattern.
d. Cast-Iron Flanges: ASME B16.1, Class 125.
e. Cast-Iron, Flanged Fittings: ASME B16.1, Class 125, galvanized.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PIPING APPLICATIONS

A. Special pipe fittings with pressure ratings at least equal to piping pressure ratings may be used in applications below, unless otherwise indicated.

B. Flanges and unions may be used on aboveground pressure piping, unless otherwise indicated.

C. Aboveground, soil, waste, and vent piping must be:

1. Hubless cast-iron soil pipe and fittings; heavy-duty stainless-steel couplings; and hubless-coupling joints.

D. Underslab and underground, soil, waste and vent piping must be:

1. Extra heavy class, hub-and-spigot, cast-iron soil pipe and fittings; gaskets; and compression joints

E. All exposed sanitary and vent pipes must be provided with PVC Jacketing.

3.3 PIPING INSTALLATION

A. Basic piping installation requirements are specified in Section 220500 "Common Work Results for Plumbing."

B. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers.

C. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Sleeves and mechanical sleeve seals are specified in Section 220500 "Common Work Results for Plumbing."

D. Install wall penetration system at each service pipe penetration through foundation wall. Make installation watertight. Wall penetration systems are specified in Section 220500 "Common Work Results for Plumbing."

E. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

F. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back-to-back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.

G. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.

H. Install soil and waste drainage and vent piping at the following minimum slopes, unless otherwise indicated:

1. Building Sanitary Drain: 2 percent downward in direction of flow for piping NPS 2.5 (DN 65) and smaller; 1 percent downward in direction of flow for piping NPS 3 (DN 80) and larger.
2. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.

I. Sleeves are not required for cast-iron soil piping passing through concrete slabs-on-grade if slab is without membrane waterproofing.

J. Do not enclose, cover, or put piping into operation until it is inspected and approved by Commissioner.

K. Properly restrain sanitary and vent pipes at the bottom of each riser

3.4 JOINT CONSTRUCTION

A. Basic piping joint construction requirements are specified in Section 220500 "Common Work Results for Plumbing."

B. Cast-Iron, Soil-Piping Joints: Make joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

1. Gasketed Joints: Make with rubber gasket matching class of pipe and fittings.
2. Hubless Joints: Make with rubber gasket and sleeve or clamp.

C. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.

D. PVC Non-pressure Piping Joints: Join piping according to ASTM D 2665.

3.5 VALVE INSTALLATION

A. General-duty valves are specified in Section 220523 "General-Duty Valves for Plumbing Piping."

B. Shutoff Valves: Install shutoff valve on each sewage pump discharge.

1. Use gate or full-port ball valve for piping NPS 2 (DN 50) and smaller.
2. Use gate valve for piping NPS 2-1/2 (DN 65) and larger.

C. Check Valves: Install swing check valve, downstream from shutoff valve, on each sewage pump discharge.

D. Backwater Valves: Install backwater valves in piping subject to sewage backflow.

1. Horizontal Piping: Horizontal backwater valves. Use normally closed type, unless otherwise indicated.
2. Floor Drains: Drain outlet backwater valves, unless drain has integral backwater valve.
3. Install backwater valves in accessible locations.

4. Backwater valves are specified in Section 221319 "Sanitary Waste Piping Specialties."

3.6 HANGER AND SUPPORT INSTALLATION

A. Pipe hangers and supports are specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment." Install the following:

1. Vertical Piping: MSS Type 8 or Type 42, clamps.
2. Individual, Straight, Horizontal Piping Runs: According to the following:

   a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
   b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
   c. Longer Than 100 Feet, if Indicated: MSS Type 49, spring cushion rolls.

3. Multiple, Straight, Horizontal Piping Runs 100 Feet (30 m) or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
4. Base of Vertical Piping: MSS Type 52, spring hangers.

B. Install supports according to Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."

C. Support vertical piping and tubing at base and at each floor.

D. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch (10-mm) minimum rods.

E. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
2. NPS 3 60 inches with 1/2-inch rod.
3. NPS 4 and NPS 5 (DN 100 and DN 125): 60 inches with 5/8-inch rod.
4. NPS 6 60 inches with 3/4-inch rod.
5. Spacing for 10-foot) lengths may be increased to 10 feet. Spacing for fittings is limited to 60 inches

F. Install supports for vertical cast-iron soil piping every 15 feet

G. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/4: 84 inches with 3/8-inch rod.
2. NPS 1-1/2: 108 inches with 3/8-inch rod.
3. NPS 2: 10 feet with 3/8-inch rod.
4. NPS 2-1/2: 11 feet with 1/2-inch rod.
5. NPS 3: 12 feet (3.7 m) with 1/2-inch rod.
6. NPS 4 and NPS 5: 12 feet with 5/8-inch rod.
7. NPS 6: 12 feet with 3/4-inch rod.

H. Install supports for vertical steel piping every 15 feet.

I. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/4: 72 inches with 3/8-inch rod.
2. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
3. NPS 2-1/2: 108 inches (2700 mm) with 1/2-inch rod.
4. NPS 3 to NPS 5: 10 feet with 1/2-inch rod.
5. NPS 6: 10 feet with 5/8-inch rod.

J. Install supports for vertical copper tubing every 10 feet.

K. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.7 CONNECTIONS

A. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.

B. Connect drainage and vent piping to the following:

1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by NYC Plumbing Code 2014. Refer to Section 221319 "Sanitary Waste Piping Specialties."
2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by Commissioner.
3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by NYC Plumbing Code 2014. Refer to Section 221319 "Sanitary Waste Piping Specialties."
4. Equipment: Connect drainage piping as indicated. Provide shutoff valve, if indicated, and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 (DN 65) and larger.

3.8 FIELD QUALITY CONTROL

A. During installation, notify Commissioner at least 24 hours before inspection must be made. Perform tests specified below in presence of Commissioner.

1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
2. Final Inspection: Arrange for final inspection by Commissioner to observe tests specified below and to ensure compliance with requirements.

B. Re-inspection: If Commissioner finds that piping will not pass test or inspection, make required corrections and arrange for re-inspection.

C. Reports: Prepare inspection reports and have them signed by Commissioner.

D. Test sanitary drainage and vent piping according to procedures of NYC Plumbing Code 2014.

1. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
2. Prepare reports for tests and required corrective action.

3.9 CLEANING

A. Clean interior of piping. Remove dirt and debris as work progresses.

B. Protect drains during the remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

C. Place plugs in ends of uncompleted piping at end of day and when work stops.

END OF SECTION 22 13 16

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 22 13 19 - SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes:

1. Cleanouts.
2. Floor drains.
3. Funnel Drains.
4. Standpipe.
5. Roof flashing assemblies.
6. Miscellaneous sanitary drainage piping specialties.
7. Flashing materials.
8. Backwater valves.
9. Fresh Air Inlet.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Trench Drainage System: Provide shop drawings showing trench layout with all dimensions and components and submittals for all components.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Drainage piping specialties must bear label, stamp, or other markings of specified testing agency.

1.6 WARRANTY

A. Manufacturer must provide product warranty extending 12 months from date of substantial completion.

PART 2 - PRODUCTS

2.1 CLEANOUTS

A. Exposed Cast-Iron Cleanouts

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Josam Company; Josam Div.
   b. MIFAB, Inc.
   c. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
   d. Tyler Pipe; Wade Div.
   e. Watts Drainage Products Inc.
   f. Zurn Plumbing Products Group; Specification Drainage Operation.
   g. Or approved equal.

2. Standard: ASME A112.36.2M.

3. Size: Same as connected drainage piping

4. Body Material: Hubless, cast-iron soil pipe test tee as required to match connected piping.

5. Closure: brass plug.

6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.

B. Cast-Iron Floor Cleanouts

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Josam Company; Josam Div.
   b. Oatey.
   c. Sioux Chief Manufacturing Company, Inc.
   d. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
   e. Tyler Pipe; Wade Div.Watts Drainage Products Inc.
   f. Zurn Plumbing Products Group; Light Commercial Operation.
   g. Zurn Plumbing Products Group; Specification Drainage Operation.

h. Or approved equal.

2. Standard: ASME A112.36.2M for threaded, adjustable housing cleanout.

3. Size: Same as connected branch.

4. Type: Threaded, adjustable housing.

5. Body or Ferrule: Cast iron.

6. Clamping Device: Not required.

7. Outlet Connection: Inside calk.

8. Closure: Brass plug with tapered threads.

9. Adjustable Housing Material: Cast iron with threads.

10. Frame and Cover Material and Finish: Nickel-bronze.

11. Frame and Cover Shape: Round.

12. Top Loading Classification: Medium duty.

13. Riser: ASTM A 74, Service class, cast-iron drainage pipe fitting and riser to cleanout.

C. Cast-Iron Wall Cleanouts

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Josam Company; Josam Div.
   b. MIFAB, Inc.
   c. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
   d. Tyler Pipe; Wade Div.
   e. Watts Drainage Products Inc.
   f. Zurn Plumbing Products Group; Specification Drainage Operation.
   g. Or approved equal.

2. Standard: ASME A112.36.2M. Include wall access.

3. Size: Same as connected drainage piping.

4. Body: Hubless, cast-iron soil pipe test tee as required to match connected piping.

5. Closure: drilled-and-threaded brass plug.

6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.

7. Wall Access: Round, flat, stainless steel cover plate with screw.

2.2 FLOOR DRAINS

A. Cast-Iron Floor Drains FD-1 in bathrooms and other finish areas must be cast iron with flashing collar and adjustable strainer head, trap primer connection.

1. Basis -of Design Product: Subject to compliance with requirements, provide J.R. Smith Model 2005-A-075 or comparable product by one of the following.
   a. Commercial Enameling Co.
   b. Josam Company; Josam Div.
   c. MIFAB, Inc.
   d. Prier Products, Inc.
   e. Tyler Pipe; Wade Div.
   f. Watts Drainage Products Inc.
   g. Zurn Plumbing Products Group; Light Commercial Operation.
   h. Zurn Plumbing Products Group; Specification Drainage Operation.
   i. Or approved equal.

2. Standard: ASME A112.6.3.

3. Pattern: Floor drain.

4. Body Material: Duco cast iron.

5. Seepage Flange: Required.

6. Anchor Flange: Required.

7. Clamping Device: Required.

8. Outlet: Bottom.

9. Backwater Valve: Not required.

10. Coating on Interior and Exposed Exterior Surfaces: Not required.

11. Sediment Bucket: Not required.

12. Top or Strainer Material: Nickel bronze.

13. Top of Body and Strainer Finish: Nickel bronze.

14. Top Shape: Round.

15. Dimensions of Top or Strainer: 5”.

16. Top Loading Classification: Light Duty.

17. Funnel: Required where shown on contract drawings.

18. Inlet Fitting: Not required.

19. Trap Material: Cast iron.

20. Trap Pattern: P-trap.

21. Trap Priming: Required.

B. Cast-Iron Floor Drains FD-2 in Utility Room and other similar areas must be medium duty cast iron with flashing clamp, adjustable cast iron tractor nickel bronze top grate, "safe-set" sediment bucket, trap primer connection where shown on drawings.

1. Basis -of Design Product: Subject to compliance with requirements, provide J.R.Smith Model 2120-P075-B-U-NB or comparable product by one of the following:
   a. Commercial Enameling Co.
   b. Josam Company; Josam Div.
   c. MIFAB, Inc.
   d. Prier Products, Inc.
   e. Tyler Pipe; Wade Div.
   f. Watts Drainage Products Inc.
   g. Zurn Plumbing Products Group; Light Commercial Operation.
   h. Zurn Plumbing Products Group; Specification Drainage Operation.
   i. Or approved equal.

2. Standard: ASME A112.6.3.

3. Pattern: Floor drain.

4. Body Material: Duco cast iron.

5. Seepage Flange: Required.

6. Anchor Flange: Required.

7. Clamping Device: Required.

8. Outlet: Bottom.

9. Backwater Valve: Not required.

10. Coating on Interior and Exposed Exterior Surfaces: Not required.

11. Sediment Bucket: Required.

12. Top or Strainer Material: Nickel bronze.

13. Top of Body and Strainer Finish: Nickel bronze.

14. Top Shape: Round.

15. Dimensions of Top or Strainer: 8.5".

16. Top Loading Classification: Medium Duty.

17. Funnel: Required where shown on contract drawings.

18. Inlet Fitting: Not required.

19. Trap Material: Cast iron.

20. Trap Pattern: P-trap.

21. Trap Priming: Required.

2.3 MISCELLANEOUS SANITARY DRAINAGE PIPING SPECIALTIES

A. Open Drains (standpipe)

1. Description: Shop or field fabricate from ASTM A 74, Service class, hub-and-spigot, cast-iron, soil-pipe fittings. Include P-trap, 18" long hub-and-spigot riser section; and where required, increaser fitting joined with ASTM C 564, rubber gaskets.

2. Size: Same as connected waste piping.

B. Floor-Drain, Trap-Seal Primer Fittings

1. Description: Cast iron, with threaded inlet and threaded or spigot outlet, and trap-seal primer valve connection.

2. Size: Same as floor drain outlet with NPS 1/2 (DN 15) side inlet.

C. Air-Gap Fittings

1. Standard: ASME A112.1.2, for fitting designed to ensure fixed, positive air gap between installed inlet and outlet piping.

2. Body: Bronze or cast iron.

3. Inlet: Opening in top of body.

4. Outlet: Larger than inlet.

5. Size: Same as connected waste piping and with inlet large enough for associated indirect waste piping.

D. Funnel Drain with deep seal trap

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. J R Smith, Model 7219S-P.
   b. Zurn, Model Z1019, with acid resisting epoxy coated finish.
   c. Mifab, Model MI Funnel drain with acid resisting epoxy coated finish.
   d. Or approved equal.

2. Funnel drain must be duco cast iron with acid resistant coated interior and exterior with no-hub adaptor, 4" outlet.

2.4 FLASHING MATERIALS

A. Lead Sheet: ASTM B 749, Type L51121, copper bearing, with the following minimum weights and thicknesses, unless otherwise indicated:

1. General Use: 4.0-lb/sq. ft. (20-kg/sq. m), 0.0625-inch (1.6-mm) thickness.

2. Vent Pipe Flashing: 3.0-lb/sq. ft. (15-kg/sq. m), 0.0469-inch (1.2-mm) thickness.

3. Burning: 6-lb/sq. ft. (30-kg/sq. m), 0.0938-inch (2.4-mm) thickness.

B. Fasteners: Metal compatible with material and substrate being fastened.

C. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.

D. Solder: ASTM B 32, lead-free alloy.

E. Bituminous Coating: SSPC-Paint 12, solvent-type, bituminous mastic.

2.5 BACKWATER VALVE

A. Horizontal, Cast-Iron Backwater Valves

1. Basis -of Design Product: Subject to compliance with requirements, provide J.R. Smith Model 7012 or comparable product by one of the following:
   a. Josam Company; Josam Div.
   b. MIFAB, Inc.
   c. Tyler Pipe; Wade Div.
   d. Watts Drainage Products Inc.
   e. Zurn Plumbing Products Group; Specification Drainage Operation.
   f. Or approved equal.

2. Standard: ASME A112.14.1.

3. Size: Same as connected piping.

4. Body: Cast iron.

5. Cover: Cast iron with threaded access check valve.

6. End Connections: Hub and Spigot.

7. Type Check Valve: Removable, bronze, swing check, factory assembled or field modified to hang ¼”open for airflow unless subject to backflow condition.

8. Extension: ASTM A 74, Service class; full-size, cast-iron, soil-pipe extension to field-installed cleanout at floor; replaces backwater valve cover.

2.6 FRESH AIR INLETS

A. Horizontal, Protected cover for the sanitary fresh air inlet

1. Basis -of Design Product: Subject to compliance with requirements, provide J.R. Smith Model 9005 or comparable product by one of the following:

   a. MIFAB, Inc.
   b. Tyler Pipe; Wade Div.
   c. Watts Drainage Products Inc.
   d. Or approved equal.

2. Size: Same as connected piping.

3. Body: Chrome Plated with Vandal Proof Screws.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Refer to Section 220500 "Common Work Results for Plumbing" for piping joining materials, joint construction, and basic installation requirements.

B. Install backwater valves in building drain piping. For interior installation, provide cleanout deck plate flush with floor and centered over backwater valve cover, and of adequate size to remove valve cover for servicing.

C. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:

1. ize same as drainage piping up to NPS 4 (DN 100). Use NPS 4 (DN 100) for larger drainage piping unless larger cleanout is indicated.

2. Locate at each change in direction of piping greater than 45 degrees.

3. Locate at minimum intervals of 50 feet (15 m) for piping NPS 4 (DN 100) and smaller and 100 feet (30 m) for larger piping.

4. Locate at base of each vertical soil and waste stack.

D. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.

E. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.

F. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated:

1. Position floor drains for easy access and maintenance.

2. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates depressed according to the following drainage area radii:
   a. Radius, 30 Inches (750 mm) or Less: Equivalent to 1 percent slope, but not less than 1/4-inch (6.35-mm) total depression.
   b. Radius, 30 to 60 Inches (750 to 1500 mm): Equivalent to 1 percent slope.

c. Radius, 60 Inches (1500 mm) or Larger: Equivalent to 1 percent slope, but not greater than 1-inch (25-mm) total depression.

3. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.

4. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.

G. Install roof flashing assemblies on sanitary stack vents and vent stacks that extend through roof.

H. Install flashing fittings on sanitary stack vents and vent stacks that extend through roof.

I. Assemble open drain fittings and install with top of hub 2 inches (51 mm) above floor.

J. Install deep-seal traps on floor drains and other waste outlets, if indicated.

K. Install floor-drain, trap-seal primer fittings on inlet to floor drains that require trap-seal primer connection.

1. Exception: Fitting may be omitted if trap has trap-seal primer connection.

2. Size: Same as floor drain inlet.

L. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.

M. Install sleeve flashing device with each riser and stack passing through floors with waterproof membrane.

N. Install vent caps on each vent pipe passing through roof.

O. Install grease interceptors, including trapping, venting, and flow-control fitting, according to manufacturer's requirements with clear space for servicing.

1. Above-Floor Installation: Set unit with bottom resting on floor, unless otherwise indicated.

2. Flush with Floor Installation: Set unit and extension, if required, with cover flush with finished floor.

3. Recessed Floor Installation: Set unit in receiver housing having bottom or cradle supports, with receiver housing cover flush with finished floor.

4. Install cleanout immediately downstream from interceptors not having integral cleanout on outlet.

P. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.

Q. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.

3.3 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment to allow service and maintenance.

3.4 FLASHING INSTALLATION

A. Fabricate flashing from single piece unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:

1. Lead Sheets: Burn joints of lead sheets 6.0-lb/sq. ft. (30-kg/sq. m), 0.0938-inch (2.4-mm) thickness or thicker. Solder joints of lead sheets 4.0-lb/sq. ft. (20-kg/sq. m), 0.0625-inch (1.6-mm) thickness or thinner.

B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.

1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches (250 mm), and skirt or flange extending at least 8 inches (200 mm) around pipe.

2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches (200 mm) around sleeve.

3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches (200 mm) around specialty.

C. Set flashing on floors and roofs in solid coating of bituminous cement.

D. Secure flashing into sleeve and specialty clamping ring or device.

E. Install flashing for piping passing through roofs with counterflashing or commercially made flashing fittings, according to Section 076200 "Sheet Metal Flashing and Trim”.

F. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast-iron sleeve having calking recess.

3.5 LABELING AND IDENTIFYING

A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each grease interceptor.

B. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.6 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 22 13 19

THIS PAGE INTENTIONALLY LEFT BLANK

ECTION 22 14 13 – FACILITY STORM DRAINAGE PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes the following storm drainage piping inside the building.

1. Pipe, tube, and fittings.
2. Special pipe fittings.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Field quality-control inspection and test reports.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Piping materials must bear label, stamp, or other markings of specified testing agency.

1.6 PERFORMANCE REQUIREMENTS

A. Components and installation must be capable of withstanding the following minimum working pressure, unless otherwise indicated:

1. Storm Drainage Piping: 10-foot head of water.

1.7 WARRANTY

A. Manufacturer must provide product warranty extending 12 months from date of substantial completion.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

A. Hub-and-Spigot, Cast-Iron Pipe and Fittings: ASTM A 74, Extra heavy class.

1. Gaskets: ASTM C 564, rubber.

B. Hubless Cast-Iron Pipe and Fittings: ASTM A 888 or CISPI 301.

1. Shielded Couplings: ASTM C 1277 assembly of metal shield or housing, corrosion-resistant fasteners, and rubber sleeve with integral, center pipe stop.

a. Heavy-Duty, Shielded, Stainless-Steel Couplings: With stainless-steel shield, stainless-steel bands and tightening devices, and ASTM C 564, rubber sleeve.

C. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade A or B, Schedule 40, galvanized. Include ends matching joining method.

1. Drainage Fittings: ASME B16.12, galvanized, threaded, cast-iron drainage pattern.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PIPING APPLICATIONS

A. Special pipe fittings with pressure ratings at least equal to piping pressure ratings may be used in applications below, unless otherwise indicated.

B. Aboveground storm drainage piping, must be:

1. Hubless cast-iron soil pipe and fittings; heavy-duty shielded, stainless-steel couplings; and coupled joints.

C. Underground and Underslab storm drainage piping must be:

1. Extra heavy, cast-iron soil pipe and fittings; gaskets; and gasketed joints.

3.3 PIPING INSTALLATION

A. Basic piping installation requirements are specified in Section 220500 "Common Work Results for Plumbing."

B. Install cleanouts at grade and extend to where building storm drains connect to building storm sewers. Cleanouts are specified in Section 221423 "Storm Drainage Piping Specialties."

C. Provide concealed storm water pipes, vertical and horizontal, with 1” insulation. Provide exposed storm water pipes, vertical and horizontal, with 1” insulation and PVC jacket.

D. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Sleeves and mechanical sleeve seals are specified in Division 22 Section 220500 "Common Work Results for Plumbing."

E. Install wall-penetration-fitting system at each service pipe penetration through foundation wall. Make installation watertight.

F. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

G. Make changes in direction for storm piping using appropriate branches, bends, and long-sweep bends. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.

H. Lay buried building drain piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.

I. Install storm drainage piping at the following minimum slopes, unless otherwise indicated:

1. Building Storm Drain: 1 percent downward in direction of flow for piping NPS 3 (DN 80) and smaller; 1 percent downward in direction of flow for piping NPS 4 (DN 100) and larger.
2. Horizontal Storm-Drainage Piping: 2 percent downward in direction of flow.

J. Sleeves are not required for cast-iron soil piping passing through concrete slabs-on-grade if slab is without membrane waterproofing.

K. Do not enclose, cover, or put piping into operation until it is inspected and approved by Commissioner.

3.4 JOINT CONSTRUCTION

A. Basic piping joint construction requirements are specified in Section 220500 "Common Work Results for Plumbing."

B. Hub-and-Spigot, Cast-Iron Soil Piping Gasketed Joints: Join according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.

C. Hubless Cast-Iron Soil Piping Coupled Joints: Join according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-coupling joints.

3.5 VALVE INSTALLATION

A. Backwater Valves: Install backwater valves in piping subject to backflow.

1. Horizontal Piping: Horizontal backwater valves. Use normally closed type, unless otherwise indicated.
2. Install backwater valves in accessible locations.
3. Backwater valves are specified in Section 221423 "Storm Drainage Piping Specialties."

3.6 HANGER AND SUPPORT INSTALLATION

A. Pipe hangers and supports are specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment." Install the following:

1. Vertical Piping: MSS Type 8 or Type 42, clamps.
2. Individual, Straight, Horizontal Piping Runs: According to the following:
   a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
   b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
   c. Longer Than 100 Feet, if indicated: MSS Type 49, spring cushion rolls.
3. Multiple, Straight, Horizontal Piping Runs 100 Feet (30 m) or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
4. Base of Vertical Piping: MSS Type 52, spring hangers.

B. Install supports according to Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."

C. Support vertical piping and tubing at base and at each floor.

D. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch (10-mm) minimum rods.

E. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
2. NPS 3: 60 inches with 1/2-inch rod.
3. NPS 4 and NPS 5: 60 inches with 5/8-inch rod.
4. NPS 6: 60 inches with 3/4-inch rod.
5. Spacing for 10-foot lengths may be increased to 10 feet. Spacing for fittings is limited to 60 inches.

F. Install supports for vertical cast-iron soil piping every 15 feet.

G. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/4: 84 inches with 3/8-inch rod.
2. NPS 1-1/2: 108 inches with 3/8-inch rod.
3. NPS 2 :10 feet with 3/8-inch rod.
4. NPS 2-1/2: 11 feet with 1/2-inch rod.
5. NPS 3:12 feet with 1/2-inch rod.
6. NPS 4 and NPS 5: 12 feet with 5/8-inch rod.

7. NPS 6: 12 feet with 3/4-inch rod.

H. Install supports for vertical steel piping every 15 feet.

I. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/4: 72 inches with 3/8-inch rod.
2. NPS 1-1/2 and NPS 2 : 96 inches with 3/8-inch rod.
3. NPS 2-1/2: 108 inches with 1/2-inch rod.
4. NPS 3 to NPS 5: 10 feet with 1/2-inch rod.
5. NPS 6 (DN 150): 10 feet with 5/8-inch rod.

J. Install supports for vertical copper tubing every 10 feet.

K. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.7 CONNECTIONS

A. Connect interior storm drainage piping to exterior storm drainage piping. Use transition fitting to join dissimilar piping materials.

B. Connect storm drainage piping to roof drains and storm drainage piping specialties.

3.8 FIELD QUALITY CONTROL

A. During installation, notify Commissioner at least 24 hours before inspection must be made. Perform tests specified below in presence of Commissioner.

1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in.
2. Final Inspection: Arrange for final inspection by Commissioner to observe tests specified below and to ensure compliance with requirements.

B. Re-inspection: If Commissioner finds that piping will not pass test or inspection, make required corrections and arrange for re-inspection.

C. Reports: Prepare inspection reports and have them signed by Commissioner.

D. Test storm drainage piping per requirements of 2014 NYC Plumbing Code.

3.9 CLEANING

A. Clean interior of piping. Remove dirt and debris as work progresses.

B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

C. Place plugs in ends of uncompleted piping at end of day and when work stops.

END OF SECTION 22 14 13

SECTION 22 14 23 - STORM DRAINAGE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes:

1. Cleanouts.
2. Roof drains.
3. Area drains.
4. Miscellaneous storm drainage piping specialties.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Drainage piping specialties must bear label, stamp, or other markings of specified testing agency.

1.6 WARRANTY

A. Manufacturer must provide product warranty extending 12 months from date of substantial completion.

PART 2 - PRODUCTS

2.1 CLEANOUTS

A. Exposed Cast-Iron Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Josam Company; Josam Div.
   b. MIFAB, Inc.
   c. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
   d. Tyler Pipe; Wade Div.
   e. Watts Drainage Products Inc.
   f. Zurn Plumbing Products Group; Specification Drainage Operation.
   g. Or approved equal.

2. Standard: ASME A112.36.2M for cast iron.
3. Size: Same as connected drainage piping
4. Body Material: Hubless, cast-iron soil pipe test tee as required to match connected piping.
5. Closure: Countersunk or raised-head, brass plug.
6. Closure Plug Size: Same as cleanout size.

B. Cast-Iron Floor Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Josam Company; Josam Div.
   b. Oatey.
   c. Sioux Chief Manufacturing Company, Inc.
   d. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
   e. Tyler Pipe; Wade Div.
   f. Watts Drainage Products Inc.
   g. Zurn Plumbing Products Group; Light Commercial Operation.
   h. Zurn Plumbing Products Group; Specification Drainage Operation.
   i. Or approved equal.

2. Standard: ASME A112.36.2M for threaded, adjustable housing cleanout.
3. Size: Same as connected branch.
4. Type: Threaded, adjustable housing.
5. Body or Ferrule: Cast iron.
6. Clamping Device: Required for membrane floors only.
7. Outlet Connection: Inside calk.
8. Closure: Brass plug with straight threads and gasket.
9. Adjustable Housing Material: nickel bronze with threads.
10. Frame and Cover Material and Finish: Nickel-bronze.
11. Frame and Cover Shape: Round.
12. Top Loading Classification: Medium Duty.

13. Riser: ASTM A 74, Extra-Heavy-class, cast-iron drainage pipe fitting and riser to cleanout.

C. Cast-Iron Wall Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Josam Company; Josam Div.
   b. MIFAB, Inc.
   c. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
   d. Tyler Pipe; Wade Div.
   e. Watts Drainage Products Inc.
   f. Zurn Plumbing Products Group; Specification Drainage Operation.
   g. Or approved equal.

2. Standard: ASME A112.36.2M. Include wall access.
3. Size: Same as connected drainage piping.
4. Body: Hubless, cast-iron soil pipe test tee as required to match connected piping.
5. Closure: Countersunk or raised-head, drilled-and-threaded brass plug.
6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.
7. Wall Access: Round, flat, stainless-steel cover plate with screw.

2.2 ROOF DRAINS

A. Cast-Iron Roof Drains (RD):

1. Basis -of Design Product: Subject to compliance with requirements, provide J.R.Smith Model 1085-E R-C-U-CID or comparable product by one of the following:
   a. Josam Company; Josam Div.
   b. MIFAB, Inc.
   c. Tyler Pipe; Wade Div.
   d. Watts Drainage Products Inc.
   e. Zurn Plumbing Products Group; Light Commercial Operation.
   f. Zurn Plumbing Products Group; Specification Drainage Operation.
   g. Or approved equal.

2. Standard: ASME A112.21.2M.
3. Pattern: Roof drain.
4. Body Material: Cast iron with wide flange.
5. Dimensions of Body: 15-1/4”.
6. Combination Flashing Ring and Gravel Stop.
7. Flow-Control Weirs: 1 Required.
8. Outlet: Side or Bottom.
9. Dome Material: Cast iron.
10. Extension: Perforated Extension.
11. Underdeck Clamp: Required.
12. Sump Receiver: Required.

B. Cast-Iron Emergency Roof Drains (ERD):

1. Basis -of Design Product: Subject to compliance with requirements, provide J.R.Smith Model 1070-E-C-R-WD02-U-CID or comparable product by one of the following.
   a. Josam Company; Josam Div.
   b. MIFAB, Inc.
   c. Tyler Pipe; Wade Div.
   d. Watts Drainage Products Inc.
   e. Zurn Plumbing Products Group; Light Commercial Operation.
   f. Zurn Plumbing Products Group; Specification Drainage Operation.
   g. Or approved equal.

2. Standard: ASME A112.21.2M.
3. Pattern: Roof drain with wide flange.
4. Body Material: Cast iron.
5. Dimensions of Body: 15-1/4”.
6. Combination Flashing Ring and Gravel Stop.
7. Flow-Control Weirs: Not required.
8. PVC Standpipe: 2”
9. Outlet: Side.
10. Dome Material: Cast iron.
11. Extension: Perforated Extension.
12. Underdeck Clamp: Required.
13. Sump Receiver: Required.

2.3 AREA DRAINS

A. Area Drain in concrete ramp and outdoor stair landings (AD-1).
1. Basis -of Design Product: Subject to compliance with requirements, provide J.R.Smith Model 2005-1460-U-M or comparable product by one of the following.

   a. Josam Company; Josam Div.
   b. MIFAB, Inc.
   c. Tyler Pipe; Wade Div.
   d. Watts Drainage Products Inc.
   e. Zurn Plumbing Products Group; Light Commercial Operation.
   f. Zurn Plumbing Products Group; Specification Drainage Operation.
   g. Or approved equal.

2. Standard: ASME A112.21.2M.
3. Pattern: Floor drain.
4. Body Material: Duco Cast iron.
5. Dimensions of Body: 11x11”.
6. Outlet: Side.
7. Dome Material: Ductile Iron Heelproof Grate.
8. Trap Priming Connection: Not Required.
9. Sediment Bucket: Required.

B. Landscaping Area Drains, Outdoor (AD-2):
   1. Basis -of Design Product: Subject to compliance with requirements, provide J.R.Smith Model D2630-NB or comparable product by one of the following:

      a. Josam Company; Josam Div.
      b. MIFAB, Inc.
      c. Tyler Pipe; Wade Div.
      d. Watts Drainage Products Inc.
      e. Zurn Plumbing Products Group; Light Commercial Operation.
      f. Zurn Plumbing Products Group; Specification Drainage Operation.
      g. Or approved equal.

   2. Standard: ASME A112.21.2M.
   3. Pattern: Floor drain.
   4. Body Material: Duco Cast iron.
   5. Dimensions of Body: 12”x12”.
   6. Outlet: Bottom.
   7. Dome Material: ADA, Nickel Bronze, Cast Iron Grade.
   8. Sediment Bucket: Required.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Refer to Section 220500 "Common Work Results for Plumbing" for piping joining materials, joint construction, and basic installation requirements.

B. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:
   1. Size same as drainage piping up to NPS 4 (DN 100). Use NPS 4 (DN 100) for larger drainage piping unless larger cleanout is indicated.
   2. Locate at each change in direction of piping greater than 45 degrees.
   3. Locate at minimum intervals of 50 feet (15 m) for piping NPS 4 (DN 100) and smaller and 100 feet (30 m) for larger piping.
   4. Locate at base of each vertical soil and waste stack.

C. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.

D. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.

E. Install roof drains at low points of roof areas according to roof membrane manufacturer's written installation instructions.
   1. Install roof-drain flashing collar or flange so that there will be no leakage between drain and adjoining roofing. Maintain integrity of waterproof membranes where penetrated.
   2. Position roof drains for easy access and maintenance.

F. Install sleeve flashing device with each riser and stack passing through floors with waterproof membrane.

G. Install cast-iron soil pipe downspout boots at grade with top of hub 6 inches above grade.

H. Install conductor nozzles at exposed bottom of conductors where they spill onto grade.

I. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.

3.3 CONNECTIONS

A. Piping installation requirements are specified in Section 221413 “Facility Storm Drainage Piping”. Drawings indicate general arrangement of piping, fittings, and specialties.

3.4 FLASHING INSTALLATION

A. Fabricate flashing from single piece unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:

   1. Lead Sheets: Burn joints of lead sheets 6.0-lb/sq. ft. (30-kg/sq. m), 0.0938-inch (2.4-mm) thickness or thicker. Solder joints of lead sheets 4.0-lb/sq. ft. (20-kg/sq. m), 0.0625-inch (1.6-mm) thickness or thinner.

B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.

   1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches (250 mm), and skirt or flange extending at least 8 inches (200 mm) around pipe.
   2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches (200 mm) around sleeve.
   3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches (200 mm) around specialty.

C. Set flashing on floors and roofs in solid coating of bituminous cement.

D. Secure flashing into sleeve and specialty clamping ring or device.

3.5 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 22 14 23

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 22 14 29 - SUMP PUMPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes submersible sump pumps and accessories, inside the building, for building storm drainage systems.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each type and size of sump pump specified. Include certified performance curves with operating points plotted on curves, and rated capacities of selected models, furnished specialties, and accessories.

B. Shop Drawings: Diagram power, signal, and control wiring.

C. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 “Quality Requirements”.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70-2010, Article 100, by a testing agency and marked for intended use.

1.6 WARRANTY

A. Manufacturers must provide product warranty extending 12 months from date of substantial completion.

PART 2 - PRODUCTS

2.1 SUBMERSIBLE SUMP PUMP SP-1:

A. Basis-of-Design Product: Subject to compliance with requirements, provide sump pump Stancor Pol-Minder Model SE-50 or comparable product by one of the following:

1. Federal Pump
2. Goulds Pumps; ITT Industries.
3. Weil Pump Company, Inc.
4. Or Approved Equal.

B. Description: Factory-assembled and -tested, simplex, single-stage, submersible, direct-connected sump pumps complying with UL 778 and HI 1.1-1.2 and HI 1.3 for submersible sump pumps.

C. Casing: Cast iron; with cast-iron inlet strainer, legs that elevate pump to permit flow into impeller, and vertical discharge with companion flange for piping connection.

D. Casing and Impeller: Stainless steel casing with inlet strainer and stainless steel impeller locked firmly to the motor shaft.

E. Pump and Motor Shaft: Stainless steel, with factory-sealed, grease-lubricated ball bearings.

F. Motor: Hermetically sealed, capacitor-start type, with built-in overload protection; three-conductor waterproof power cable of length required, and with grounding plug and cable-sealing assembly for connection at pump. Pump Discharge Piping: Field fabricated ASTM A 53 /A 53 M, Schedule 40, galvanized-steel pipe.

G. Pit Cover: Slotted steel with bituminous coating and strong enough to support controls.

H. Controls: NEMA 4X control panel with HOA switch, pump run light and dry contact for connectivity.

I. Controls: Three floats – on, off and high water- must be pre-assembled at the factory.

J. General Trouble Alarm must be connected to BMS or Security system.

2.2 FLEXIBLE CONNECTORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Anamet, Inc.
2. Flex-Hose Co., Inc.
3. Flexicraft Industries.
4. Flex-Pression, Ltd.
5. Flex-Weld, Inc.

6. Hyspan Precision Products, Inc.
7. Mercer Rubber.
8. Metraflex, Inc.
9. Proco Products, Inc.
10. Tozen America Corporation.
11. Or approved equal.

B. Description: 125-psig (860-kPa) minimum working-pressure rating and ends matching pump connection:

1. Bronze Flexible Connectors: Corrugated, bronze inner tubing covered with bronze wire braid. Include copper-tube ends or bronze flanged ends, braze welded to tubing.
2. Stainless-Steel Flexible Connectors: Corrugated, stainless-steel inner tubing covered with stainless-steel wire braid. Include stainless-steel nipples or flanges, welded to tubing.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 SUMP PUMP INSTALLATION

A. Install sump pumps according to applicable requirements in HI 1.4.

B. Install pumps and arrange to provide access for maintenance including removal of motors, impellers, couplings, and accessories.

C. Set submersible sump pumps on pit floor. Make direct connections to storm drainage piping.

D. Install sump pump basins and connect to drainage piping. Brace interior of basins according to manufacturer's written instructions to prevent distortion or collapse during concrete placement. Set basin cover and fasten to basin top flange. Install cover so top surface is flush with finished floor.

E. Construct sump pump pits and connect to drainage piping. Set pit curb frame recessed in and anchored to concrete. Fasten pit cover to pit curb flange. Install cover so top surface is flush with finished floor.

F. Support piping so weight of piping is not supported by pumps.

G. Piping installation requirements are specified in Division 22 Section 221413 "Facility Storm Drainage Piping." Drawings indicate general arrangement of piping, fittings, and specialties.

H. Install piping adjacent to sump pumps to allow service and maintenance.

I. Install discharge piping equal to or greater than size of pump discharge piping. Refer to Division 22 Section 221413 "Facility Storm Drainage Piping."

   1. Install flexible connectors adjacent to pumps in discharge piping.
   2. Install check and shutoff valves on discharge piping from each pump. Install unions on pumps having threaded pipe connections. Install valves same size as connected piping.

J. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."

K. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

L. Refer to Section 220523 "General-Duty Valves for Plumbing Piping" for general-duty valves for drainage piping.

END OF SECTION 22 14 29

SECTION 22 33 00 - ELECTRIC DOMESTIC WATER HEATERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes:

1. Storage Electric Water Heaters.
2. Instantaneous Electric Water Heaters.
3. Hot Water Circulator.
4. Expansion Tank.
5. Water Heater accessories.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each type and size of water heater indicated. Include rated capacities, operating characteristics, furnished specialties, and accessories.

B. Shop Drawings: Diagram power, signal, and control wiring.

C. Operation and maintenance data.

D. Warranty.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70-2008, Article 100, by a testing agency acceptable to the Commissioner and marked for intended use.

C. ASME Compliance: Where ASME-code construction is indicated, fabricate and label commercial water heater storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

D. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9" for all components that will be in contact with potable water.

E. ASHRAE/IESNA 90.1-2013 Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2013.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of electric water heaters that fail in materials within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including storage tank and supports.
b. Faulty operation of controls.
c. Deterioration of metals, metal finishes, and other materials beyond normal use.

2. Warranty Period(s):

a. Storage Water Heaters: One year for workmanship and materials and five years (non-prorated) for pressure vessel after substantial completion.

PART 2 - PRODUCTS

2.1 COMMERCIAL STORAGE ELECTRIC DOMESTIC WATER HEATER EWH-1

A. Commercial, Storage Electric Water Heaters: Comply with UL 1453 requirements for storage-tank-type water heaters.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Electric Heater Company (The); Hubbell Heaters Division.
b. Smith, A. O. Water Products Company.
c. State Industries, Inc.
d. Or Approved Equal.

2. Storage-Tank Construction: Non-ASME-code, hydrastone cement-lined, steel vertical arrangement.

a. Tappings: Factory fabricated of materials compatible with tank and piping connections. Attach tappings to tank before testing.

1) NPS 2 (DN 50) and Smaller: Threaded ends according to ASME B1.20.1.

b. Pressure Rating: 150 psig (1035 kPa).

c. Interior Finish: Comply with NSF 61 barrier materials for potable-water tank linings, including extending lining material into tappings.

3. Factory-Installed Storage-Tank Appurtenances:

a. Anode Rod: Replaceable magnesium.
b. Drain Valve: Corrosion-resistant metal complying with ASSE 1005.
c. Insulation: Comply with ASHRAE/IESNA 90.1.
d. Jacket: Steel with enameled finish.
e. Heating Elements: Electric, screw-in or bolt-on immersion type arranged in multiples of three.

1) Staging: Input not exceeding 6 kW per step.

f. Temperature Control: Adjustable immersion thermostat with 90-140 deg F range.
g. Safety Controls: High-temperature-limit and low-water cutoff devices or systems.
h. Relief Valves: ASME rated and stamped and complying with ASME PTC 25.3, for combination temperature and pressure relief valves. Include one or more relief valves with total relieving capacity at least as great as heat input, and include pressure setting less than water heater working-pressure rating. Select one relief valve with sensing element that extends into storage tank.

4. Special Requirements: NSF 5 construction.
5. Energy Management System Interface: Normally closed dry contacts for enabling and disabling water heater.
6. Capacity and Characteristics EWH-1

a. Capacity: 20 gal.
b. Recovery: 12.1 gph at 100 deg F (56 deg C) temperature rise.
c. Temperature Setting: 140 deg F.
d. Number of Heating Elements: One.

e. Electrical Characteristics:

1) Power Demand: 3 kw
2) Volts: 208V
3) Phases: Single.
4) Hertz: 60.

2.2 INSTANTANEOUS ELECTRIC WATER HEATER EWH-2

A. Flow-Control, Instantaneous Electric Water Heaters: Comply with UL 499 for tankless electric water heater heating appliance.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Chronomite Laboratories, Inc.
b. Controlled Energy Corporation.
c. Eemax, Inc.

d. Or approved equal.

2. Construction: Copper piping or tubing complying with NSF 61 barrier materials for potable water, without storage capacity.

a. Connections: ASME B1.20.1 pipe thread.
b. Pressure Rating: 150 psig (1035 kPa).
c. Heating Element: Resistance heating system.
d. Temperature Control: Flow-control fitting.
e. Safety Control: High-temperature-limit cutoff device or system.
f. Jacket: Aluminum or steel with enameled finish or plastic.

3. Support: Bracket for wall mounting.

4. Capacity and Characteristics:

a. Temperature Control: Flow-control fitting.

1) Flow-Control Fitting: 1 gpm.
2) Water Temperature Rise: 57 deg F.

b. Electrical Characteristics:

1) Power Demand: 8.3 kilowatts.
2) Volts: 208.
3) Phases: Single.
4) Hertz: 60.
5) Full-Load Amperes: 40A.
6) Minimum Circuit Ampacity: 40A.
7) Maximum Overcurrent Protection: 50A.

2.3 HOT WATER CIRCULATOR CP-1

A. Commercial Hot Water Circulators:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Bell and Gossett.
b. Taco.
c. Grundfos.
d. Or Approved Equal

2. Pump shall be all bronze, LEAD-free, horizontal, oil-lubricated type, rated for 125 psi.

3. The motor shall be of the drip-proof, sleeve-bearing, quiet operating, rubber-mounted construction. Motors shall have built-in thermal overload protectors.

4. For pump model and rating refer to schedule on contract drawings.

2.4 AQUASTAT AND TIMER

A. Basis -of Design Product: Subject to compliance with requirements, provide product timer kit TC-1 by Bell and Gossett and AQ-1/2 aquastat by Bell and Gossett or comparable product by one of the following.

1. Taco.
2. Wilo.
3. Or approved equal.

2.5 EXPANSION TANK

A. Manufacturers: Subject to compliance with requirements, provide product by one of the following:

1. Taco.
2. Bell and Gossett.
3. Watts.
4. Or approved equal.

B. Expansion Tank shall be listed for Portable Water applications with all wetted components to be FDA approved.

C. Tank shall be bladder type with steel shell designed and constructed per ASME Section VIII, Div.1 and heavy duty butyl bladder

D. Tank shall be rated for 125 psig, 240 degree F.

2.6 WATER HEATER ACCESSORIES

A. Water Heater Stands: Water heater manufacturer's factory-fabricated steel stand for floor mounting and capable of supporting water heater and water. Include dimension that will support bottom of water heater a minimum of 18 inches (457 mm) above the floor.

B. Water Heater Mounting Brackets: Water heater manufacturer's factory-fabricated steel bracket for wall mounting and capable of supporting water heater and water.

C. Drain Pans: Corrosion-resistant metal with raised edge. Include dimensions not less than base of water heater and include drain outlet not less than NPS 3/4 (DN 20).

D. Piping-Type Heat Traps: Field-fabricated piping arrangement according to ASHRAE/IESNA 90.1 or ASHRAE 90.2.

E. Water Regulators: ASSE 1003, water-pressure reducing valve. Set at 25-psig- (172.5-kPa-) maximum outlet pressure, unless otherwise indicated.

F. Shock Absorbers: ASSE 1010 or PDI WH 201, Size A water hammer arrester.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 WATER HEATER INSTALLATION

A. Install commercial water heaters on concrete bases.

1. Exception: Omit concrete bases for commercial water heaters if installation on stand, bracket, suspended platform, or direct on floor is indicated.
2. Concrete base construction requirements are specified in Section 220500 "Common Work Results for Plumbing."

B. Install water heaters level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.

C. Install combination temperature and pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend commercial, water-heater, relief-valve outlet, with drain piping same as domestic water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.

D. Install water heater drain piping as indirect waste to spill by positive air gap into open drains or over floor drains. Install hose-end drain valves at low points in water piping for water heaters that do not have tank drains. Refer to Section 221119 "Domestic Water Piping Specialties" for hose-end drain valves.

E. Install thermometer on outlet piping of water heaters.

F. Install water regulator, with integral bypass relief valve, in booster-heater inlet piping and water hammer arrester in booster-heater outlet piping.

G. Install piping-type heat traps on inlet and outlet piping of water heater storage tanks without integral or fitting-type heat traps.

H. Fill water heaters with water.

3.3 CONNECTIONS

A. Install piping adjacent to water heaters to allow service and maintenance. Arrange piping for easy removal of water heaters.

B. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."

C. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

3.4 FIELD QUALITY CONTROL

A. Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including connections.

B. Perform the following field tests and inspections:

1. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.
2. Operational Test: After electrical circuitry has been energized, confirm proper operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C. Remove and replace water heaters that do not pass tests and inspections and retest as specified above.

3.5 INSTRUCTIONS

A. Engage a factory-authorized service representative to instruct maintenance personnel to adjust, operate, and maintain commercial electric domestic water heaters.

END OF SECTION 22 33 00

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 22 40 00 - PLUMBING FIXTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes:

1. Lavatory faucets.
2. Sink faucets.
3. Flushometers.
4. Toilet seats.
5. Protective shielding guards.
6. Fixture supports.
7. Water closets.
8. Lavatories.
9. Pantry sinks.
10. Service Sink
11. Water Cooler with Bottle Filling Station.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Diagram power, signal, and control wiring.

C. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Refer To DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100 and marked for intended use.

C. Regulatory Requirements: Comply with requirements in ICC A117.1, "Accessible and Usable Buildings and Facilities"; Public Law 90-480, "Architectural Barriers Act"; and Public Law 101-336, "Americans with Disabilities Act"; for plumbing fixtures for people with disabilities.

D. Regulatory Requirements: Comply with requirements of New York City Plumbing Code -2014 section 604 for maximum flow rates and consumption for water fixtures and WaterSence program labeling requirements..

E. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.

F. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.

G. Comply with the following applicable standards and other requirements specified for plumbing fixtures:

1. Enameled, Cast-Iron Fixtures: ASME A112.19.1M.
2. Plastic Laundry Trays: ANSI Z124.6.
3. Plastic Shower Enclosures: ANSI Z124.2.
4. Plastic Sinks: ANSI Z124.6.
5. Porcelain-Enameled, Formed-Steel Fixtures: ASME A112.19.4M.
6. Slip-Resistant Bathing Surfaces: ASTM F 462.
7. Solid-Surface-Material Lavatories and Sinks: ANSI/ICPA SS-1.
8. Stainless-Steel Residential Sinks: ASME A112.19.3.
9. Vitreous-China Fixtures: ASME A112.19.2M.
10. Water-Closet, Flush Valve, Tank Trim: ASME A112.19.5.
11. Water-Closet, Flushometer Tank Trim: ASSE 1037.

H. Comply with the following applicable standards and other requirements specified for lavatory and sink faucets:

1. Backflow Protection Devices for Faucets with Side Spray: ASME A112.18.3M.
2. Backflow Protection Devices for Faucets with Hose-Thread Outlet: ASME A112.18.3M.
3. Diverter Valves for Faucets with Hose Spray: ASSE 1025.
4. Faucets: ASME A112.18.1.
5. Hose-Connection Vacuum Breakers: ASSE 1011.
6. Hose-Coupling Threads: ASME B1.20.7.
7. Integral, Atmospheric Vacuum Breakers: ASSE 1001.
8. NSF Potable-Water Materials: NSF 61.
9. Pipe Threads: ASME B1.20.1.
10. Sensor-Actuated Faucets and Electrical Devices: UL 1951.
11. Supply Fittings: ASME A112.18.1.
12. Brass Waste Fittings: ASME A112.18.2.

I. Comply with the following applicable standards and other requirements specified for miscellaneous fittings:

1. Atmospheric Vacuum Breakers: ASSE 1001.
2. Brass and Copper Supplies: ASME A112.18.1.
3. Dishwasher Air-Gap Fittings: ASSE 1021.
4. Manual-Operation Flushometers: ASSE 1037.
5. Plastic Tubular Fittings: ASTM F 409.
6. Brass Waste Fittings: ASME A112.18.2.
7. Sensor-Operation Flushometers: ASSE 1037 and UL 1951.

J. Comply with the following applicable standards and other requirements specified for miscellaneous components:

1. Disposers: ASSE 1008 and UL 430.
2. Dishwasher Air-Gap Fittings: ASSE 1021.
3. Flexible Water Connectors: ASME A112.18.6.
4. Grab Bars: ASTM F 446.
5. Hose-Coupling Threads: ASME B1.20.7.
6. Hot-Water Dispensers: ASSE 1023 and UL 499.
7. Off-Floor Fixture Supports: ASME A112.6.1M.
8. Pipe Threads: ASME B1.20.1.
9. Plastic Toilet Seats: ANSI Z124.5.
10. Supply and Drain Protective Shielding Guards: ICC A117.1.

1.6 WARRANTY

A. Manufacturer must provide product warranty extending 12 months from substantial completion.

1.7 DEFINITIONS

A. ABS: Acrylonitrile-butadiene-styrene plastic.

B. Accessible Fixture: Plumbing fixture that can be approached, entered, and used by people with disabilities.

C. FRP: Fiberglass-reinforced plastic.

D. PMMA: Polymethyl methacrylate (acrylic) plastic.

E. PVC: Polyvinyl chloride plastic.

F. Solid Surface: Nonporous, homogeneous, cast-polymer-plastic material with heat-, impact-, scratch-, and stain-resistance qualities.

PART 2 - PRODUCTS

2.1 LAVATORY FAUCETS

A. Lavatory Faucets, L and L-H:

1. Basis-of-Design Product: Subject to compliance with requirements, provide American Standard electronic metering Faucet Innsbrook Selectronic Model 6053.204 with thermostatic mixing valve a comparable product by one of the following:

   a. Toto, Inc.
   b. Delta Faucet Company.
   c. Sloan.
   d. Or approved equal.

2. Description: ADA Compliant, Electronic, Battery Powered, Metering Washing Faucet.

   a. Body Material: Commercial, solid brass.
   b. Finish: Polished chrome plate.
   c. Maximum Flow Rate: 0.35 gpm.
   d. Centers: Singe hole.
   e. Mounting: Deck, exposed.
   f. Valve Handle(s): Not applicable.
   g. Inlet(s): NPS 3/8.
   h. Spout: Rigid type.
   i. Spout Outlet: 0.35 gpm.
   j. Operation: Electronic, 10-year battery powered.
   k. Drain: Chrome Plated Brass Grid Strainer.
   l. Tempering Device: Thermostatic Mixing Valve.
   m. Variation: Not Required.
   n. Transformer: Not required.
   o. Time Out Setting: 7.5 seconds.
   p. Cycle: 0.044 gallon per cycle.

2.2 SINK FAUCETS

A. Pantry Sink Faucets, PS:

1. Basis-of-Design Product: Subject to compliance with requirements, provide kitchen sink faucet American Standard 7074.550 or a comparable product by one of the following:

   a. Kohler.
   b. Sloan.
   c. Toto.
   d. Approved Equal.

2. Description: ADA compliant, kitchen faucet, three-hole fixture.

a. Body Material: Commercial, solid brass.
b. Finish: Polished chrome plate.
c. Maximum Flow Rate: 1.5 gpm.
d. Mixing Valve: Not required.
e. Backflow Protection Device for Hose Outlet: Not required.
f. Backflow Protection Device for Side Spray: Not required.
g. Centers: 8”.
h. Mounting: Deck, exposed.
i. Handle(s): Single for volume and temperature control.
j. Inlet(s): NPS 1/2 (DN 15).
k. Spout Type: Field-convertible gooseneck rigid/swivel gooseneck spout.
l. Vacuum Breaker: Not required.
m. Operation: Manual.
n. Power: Not Required.
o. Drain: Grid.

B. Service Sink Faucets, SS:

1. Basis-of-Design Product: Subject to compliance with requirements, provide service sink faucet Elkay Model LK940BR03L2H or a comparable product by one of the following:

a. Eljer.
b. Kohler Co.
c. American Standard.
d. Or approved equal.

2. Description: Service Sink faucet with vacuum breaker, integral stops, adjustable wall brace, pail hook and ¾” hose thread on spout.

a. Body Material: Commercial, solid brass.
b. Finish: Chrome plate.
c. Maximum Flow Rate: 2.2 gpm.
d. Mixing Valve: not required.
e. Backflow Protection Device for Hose Outlet: Not required.
f. Backflow Protection Device for Side Spray: Not required.
g. Centers: 8 inches (203 mm).
h. Mounting: Wall, exposed.
i. Handle(s): Four arm handle.
j. Inlet(s): NPS 1/2 (DN 15).
k. Spout Type: rigid spout.
l. Spout Outlet: Threaded
m. Vacuum Breaker: required.
n. Operation: Manual.
o. Drain: Grid.

2.3 FLUSHOMETERS

A. Flushometers, WC:

1. Basis-of-Design Product: Subject to compliance with requirements, provide flushometer Toto EcoPower TET1UA32#CP or a comparable product by one of the following:

   a. Sloan.
   b. Zurn Plumbing Products Group; Commercial Brass Operation.
   c. American Standard.
   d. Or approved equal.

2. Description: Exposed, Electronic Flushometer for water-closet-type fixture. Include brass body with corrosion-resistant internal components, control stop with check valve, vacuum breaker, copper or brass tubing, and polished chrome-plated finish on exposed parts.

   a. Internal Design: piston operation.
   b. Style: Exposed, chrome plated.
   c. Inlet Size: NPS 1 (DN 25).
   d. Trip Mechanism: Electronic.
   e. Consumption: 1.0 gal./flush.
   f. Tailpiece Size: NPS 1-1/2 (DN 40).

2.4 TOILET SEATS

A. Toilet Seats, WC:

1. Basis-of-Design Product: Subject to compliance with requirements, provide toilet seat Toto SC 134 or comparable product by one of the following:

   a. Bemis Manufacturing Company.
   b. Church Seats.
   c. Kohler.
   d. Or approved equal.

2. Description: Toilet seat for water-closet-type fixture.

   a. Material: Molded, solid plastic with antimicrobial agent.
   b. Configuration: Open front, without cover.
   c. Size: Elongated.
   d. Hinge Type: SS, self-sustaining.
   e. Class: Heavy-duty commercial.
   f. Color: White.

2.5 PROTECTIVE SHIELDING GUARDS

A. Protective Shielding Pipe Covers:

1. Basis-of-Design Product: Subject to compliance with requirements, provide waste and supply piping protective covers, ADA compliant, consisting of one P-trap cover and two angle valves and supplies covers, Lav Guard Model 3102 E-Z by Truebro or comparable product by one of the following:

   a. Insul-Tect Products Co.; a Subsidiary of MVG Molded Products.
   b. McGuire Manufacturing Co., Inc.
   c. Zurn Plumbing Products Group.
   d. Or approved equal.

2.6 FIXTURE SUPPORTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Josam Company.
2. MIFAB Manufacturing Inc.
3. Smith, Jay R. Mfg. Co.
4. Tyler Pipe; Wade Div.
5. Watts Drainage Products Inc.; a div. of Watts Industries, Inc.
6. Zurn Plumbing Products Group; Specification Drainage Operation.
7. Or approved equal.

B. Water-Closet Supports, WC and WC-H:

1. Description: Combination carrier designed for accessible and standard mounting height of wall-mounting, water-closet-type fixture. Include single or double, vertical or horizontal, hub-and-spigot or hubless waste fitting as required for piping arrangement; faceplates; couplings with gaskets; feet; and fixture bolts and hardware matching fixture. Include additional extension coupling, faceplate, and feet for installation in wide pipe space.
2. Basis-of- Design Product: Subject to compliance with requirements, provide J.R. Smith Model 0544 or Model 0542 or comparable product by one of the following:

   a. Zurn Plumbing Products Group.
   b. Mifab Manufacturing Inc.
   c. Josam Company.
   d. Or approved equal.

C. Lavatory Supports, L:

1. Description: Type II, lavatory carrier with concealed arms, tie rod and floor mounted uprights for wall-mounting, lavatory-type fixture. Include steel uprights with feet.
2. Basis -of- Design Product: Subject to compliance with requirements, provide J.R. Smith Model 0801 or comparable product by one of the following:

    a. Zurn Plumbing Products Group.
    b. Mifab Manufacturing Inc.
    c. Josam Company.
    d. Or approved equal.

3. Accessible-Fixture Support: Include rectangular steel uprights.

D. Pantry Sink, PS:

1. Description: concealed carrier system for entire counter and sink with painted cast iron couplings, round tubular steel uprights, 7-gauge support plates, zinc plated support hardware and welded base feet.
2. Basis-of-Design Product: Subject to compliance with requirements, provide carrier system Wade Model 614-LK or comparable product by one of the following:

    a. Zurn Plumbing Products Group.
    b. Mifab Manufacturing Inc.
    c. Josam Company.
    d. Or approved equal.

2.7 WATER CLOSETS

A. Water Closets, WC and WC-H:

1. Basis-of-Design Product: Subject to compliance with requirements, provide one-piece elongated water closet by Toto CT705ULN or a comparable product by one of the following:

    a. Kohler Co.
    b. Crane, Inc.
    c. American Standard.
    d. Or approved equal.

2. Description: Accessible, floor-mounting, vitreous-china fixture designed for flushometer valve operation.
3. Style: One-piece.

    a. Bowl Type: Elongated with siphon-jet design. Include bolt caps matching fixture.
    b. Height: Standard and Accessible where indicated on architectural drawings.
    c. Design Consumption: 1.00 gal./flush.

d. Color: White.
e. Spud: Not applicable.

4. Toilet Seat: WC.

2.8 LAVATORIES

A. Lavatories, L, L-H:

1. Basis-of-Design Product: Subject to compliance with requirements, provide lavatory American Standard 9024.001 EC or a comparable product by one of the following:

a. TOTO USA, Inc.
b. Duravit
c. Kohler.
d. Or Approved Equal.

2. Description: Accessible, wall-mounting, vitreous-china fixture.

a. Type: Concealed Arm carrier.
b. Size: 20” by 18-1/4” inches, rectangular.
c. Faucet Hole Punching: Single
d. Faucet Hole Location: Top.
e. Pedestal: Not required.
f. Color: White.
g. Faucet: Lavatory L.
h. Supplies: NPS 3/8 (DN 10) chrome-plated copper with stops.
i. Drain: Grid.

1) Location: Near back of bowl.

j. Drain Piping: NPS 1-1/4 by NPS 1-1/2 (DN 32 by DN 40) chrome-plated, cast-brass P-trap; tubular brass waste to wall and wall escutcheon.
k. Fixture Support: Lavatory L.
l. Install rim at elevation 34” above finish floor.
m. Provide protective shielding for water supplies and drain.

2.9 PANTRY SINKS

A. Pantry Sinks, PS:

1. Basis-of-Design Product: Subject to compliance with requirements, provide single bowl sink American Standard Colony 22SB.6252283S.075 or a comparable product by one of the following:

a. Elkay.
b. Eljer.

c. Kohler.
d. Or approved equal.

2. Description: Accessible, undermount, one-bowl, stainless-steel kitchen sink.

a. Overall Dimensions: 25” x 22-1/6.”
b. Metal Thickness: #20-gauge type 304 stainless steel.
c. Bowl:

1) Dimensions: 21-3/8” x 15-11/16”.
2) Drain: 3-1/2-inch crumb cup.

a) Location: Near back of bowl.

d. Sink Faucet: PS.
e. Supplies: NPS 1/2 (DN 15) chrome-plated copper with stops.
f. Drain Piping: NPS 2 (DN 40) chrome-plated, cast-brass P-trap; tubular brass waste to wall; and wall escutcheon(s).
g. Disposer: Not required.
h. Dishwasher Air-Gap Fitting: Required.
i. Hot-Water Dispenser: Not required.

2.10 SERVICE SINKS

A. Service Sink, SS:

1. Basis-of-Design Product: Subject to compliance with requirements, provide stainless steel wall hung service sink Elkay Model ESSB2520C or a comparable product by one of the following:

a. Kohler Co.
b. Eljer.
c. American Standard.
d. Or approved equal.

2. Description:

a. Material: #304 Stainless Steel.
b. Overall Dimensions: 25”x 19-1/2”x24”
c. Sink Faucet: MS.
d. Supplies: NPS 1/2 (DN 15) chrome-plated copper with stops.
e. Drain Piping: NPS 3 (DN 80) chrome-plated, cast-brass P-trap; tubular brass waste to wall; and wall escutcheon(s).
f. Drain: Cast Iron P-trap.

2.11 WATER COOLER WITH BOTTLE FILLING STATION

A. Water Cooler with Bottle Filling Station DF:

1. Basis-of-Design Product: Subject to compliance with requirements, provide bi-level ADA-compliant drinking fountain with bottle filling station Elkay Model EZSTLDDWSLK with Cane Apron Elkay Model LKAPREZL or a comparable product by one of the following:

   a. Haws
   b. Oasis
   c. Halsey Taylor
   d. Or Approved Equal.

2. Description: No-Lead, ADA compliant, dual-level, non-filtered, non-refrigerated Drinking Fountain with Bottle Filling Station.

   a. Body Material: Commercial, solid brass.
   b. Finish: Light Gray Granite
   c. Maximum Flow Rate: 1.5 gpm.
   d. Bottle Filler: no-touch, sensor –activated bottle filler.
   e. Electrical Requirements: duplex outlet, 115V/60 Hz/ 1.1A.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for Execution Requirements.

3.2 INSTALLATION

A. Assemble plumbing fixtures, trim, fittings, and other components according to manufacturers' written instructions.

B. Install off-floor supports, affixed to building substrate, for wall-mounting fixtures.

   1. Use carrier supports with waste fitting and seal for back-outlet fixtures.
   2. Use carrier supports without waste fitting for fixtures with tubular waste piping.
   3. Use chair-type carrier supports with rectangular steel uprights for accessible fixtures.

C. Install back-outlet, wall-mounting fixtures onto waste fitting seals and attach to supports.

D. Install floor-mounting fixtures on closet flanges or other attachments to piping or building substrate.

E. Install wall-mounting fixtures with tubular waste piping attached to supports.

F. Install fixtures level and plumb according to roughing-in drawings.

G. Install water-supply piping with stop on each supply to each fixture to be connected to water distribution piping. Attach supplies to supports or substrate within pipe spaces behind fixtures. Install stops in locations where they can be easily reached for operation.

H. Install trap and tubular waste piping on drain outlet of each fixture to be directly connected to sanitary drainage system.

I. Install tubular waste piping on drain outlet of each fixture to be indirectly connected to drainage system.

J. Install flushometer valves for accessible water closets and urinals with handle mounted on wide side of compartment. Install other actuators in locations that are easy for people with disabilities to reach.

K. Install tanks for accessible, tank-type water closets with lever handle mounted on wide side of compartment.

L. Install toilet seats on water closets.

M. Install faucet-spout fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.

N. Install water-supply flow-control fittings with specified flow rates in fixture supplies at stop valves.

O. Install faucet flow-control fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.

P. Install shower flow-control fittings with specified maximum flow rates in shower arms.

Q. Install traps on fixture outlets.

1. Exception: Omit trap on fixtures with integral traps.
2. Exception: Omit trap on indirect wastes, unless otherwise indicated.

R. Install disposer in outlet of each sink indicated to have disposer. Install switch where indicated or in wall adjacent to sink if location is not indicated.

S. Install dishwasher air-gap fitting at each sink indicated to have air-gap fitting. Install in sink deck. Connect inlet hose to dishwasher and outlet hose to disposer.

T. Install hot-water dispensers in back top surface of sink or in countertop with spout over sink.

U. Install escutcheons at piping wall and ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding fittings. Escutcheons are specified in Section 22 05 00 "Common Work Results for Plumbing."

V. Seal joints between fixtures and walls, floors, and countertops using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color.

3.3 CONNECTIONS

A. Piping installation requirements are specified in Section 22 11 16 “Domestic Water Piping and Section 22 13 16 “Sanitary Waste and Vent Piping”. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.

C. Ground equipment according to Section 26 05 26 "Grounding and Bonding for Electrical Systems."

D. Connect wiring according to Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."

3.4 FIELD QUALITY CONTROL

A. Verify that installed plumbing fixtures are categories and types specified for locations where installed.

B. Check that plumbing fixtures are complete with trim, faucets, fittings, and other specified components.

C. Inspect installed plumbing fixtures for damage. Replace damaged fixtures and components.

D. Test installed fixtures after water systems are pressurized for proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.

E. Install fresh batteries in sensor-operated mechanisms.

3.5 PROTECTION

A. Provide protective covering for installed fixtures and fittings.

B. Do not allow use of plumbing fixtures for temporary facilities unless approved in writing by Commissioner.

END OF SECTION 22 40 00

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 23 05 00 - COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. This Section includes the following:

1. Piping materials and installation instructions common to most piping systems.
2. Dielectric Fittings.
3. Escutcheons.
4. Equipment support base and rails.
5. Equipment installation requirements common to equipment sections.
6. Supports and anchorages.

1.3 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and chases.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.5 SUBMITTALS

A. Welding Certificates.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."

C. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

D. Electrical Characteristics for HVAC Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment must comply with requirements.

PART 2 - PRODUCTS

2.1 PIPE, TUBE, AND FITTINGS

A. Refer to individual Division 23 piping Sections for pipe, tube, and fitting materials and joining methods.

B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.2 JOINING MATERIALS

A. Refer to individual Division 23 piping Sections for special joining materials not listed below.

B. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

C. Solvent Cements for Joining Plastic Piping:

1. CPVC Piping: ASTM F 493.
2. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

2.3 DIELECTRIC FITTINGS

A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.

B. Insulating Material: Suitable for system fluid, pressure, and temperature.

C. Dielectric Unions: Factory-fabricated, union assembly, for 150psig minimum working pressure at 180 deg F.

2.4 ESCUTCHEONS

A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.

B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.

C. One-Piece, Cast-Brass Type: With set screw.

1. Finish: Polished chrome-plated.

D. Split-Casting, Cast-Brass Type: With concealed hinge and set screw.

1. Finish: Polished chrome-plated.

2.5 MECHANICAL SLEEVE SEALS

A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.

B. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.

C. Pressure Plates: Stainless steel. Include two for each sealing element.

D. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.6 SLEEVES

A. Galvanized-Steel Sheet: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.

2.7 EQUIPMENT SUPPORT BASE AND RAILS

A. Heavy gauge galvanized steel, unitized construction with integral base plate, fully insulated, continuous welded corner seams, pressure treated wood nailer, counter-flashing with screws. Internally reinforced to conform to plate load bearing factors.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PIPING SYSTEMS - COMMON REQUIREMENTS

A. Install piping according to the following requirements and Division 23 Sections specifying piping systems.

B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved by Commissioner on Coordination Drawings.

C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping at indicated slopes.

G. Install piping free of sags and bends.

H. Install fittings for changes in direction and branch connections.

I. Install piping to allow application of insulation.

J. Select system components with pressure rating equal to or greater than system operating pressure.

K. Install escutcheons for penetrations of walls, ceilings, and floors.

L. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with fire-stop materials.

M. Verify final equipment locations for roughing-in.

N. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

3.3 PIPING JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 23 Sections specifying piping systems.

B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

E. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

3.4 PIPING CONNECTIONS

A. Make connections according to the following, unless otherwise indicated:

1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
2. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.5 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.

B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.

C. Install HVAC equipment to facilitate service, maintenance, and repair and restoration or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

D. Install equipment to allow right of way for piping installed at required slope.

3.6 ERECTION OF METAL SUPPORTS AND ANCHORAGES

A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor HVAC materials and equipment.

B. Field Welding: Comply with AWS D1.1.

3.7 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor HVAC materials and equipment.

B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.

C. Attach to substrates as required to support applied loads.

END OF SECTION 23 05 00

SECTION 23 05 13 - COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section includes general requirements for single-phase and polyphase, general-purpose, horizontal, small and medium, squirrel-cage induction motors for use on ac power systems up to 600 V and installed at equipment manufacturer's factory or shipped separately by equipment manufacturer for field installation.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.5 COORDINATION

A. Coordinate features of motors, installed units, and accessory devices to be compatible with the following:
   1. Motor controllers.
   2. Torque, speed, and horsepower requirements of the load.
   3. Ratings and characteristics of supply circuit and required control sequence.
   4. Ambient and environmental conditions of installation location.

1.6 WARRANTY

A. Minimum one year from date of substantial completion.

PART 2 - PRODUCTS

2.1 GENERAL MOTOR REQUIREMENTS

A. Comply with requirements in this Section except when stricter requirements are specified in HVAC equipment schedules or Sections.

B. Comply with NEMA MG 1 unless otherwise indicated.

2.2 MOTOR CHARACTERISTICS

A. Duty: Continuous duty at ambient temperature of 40 deg C and at altitude of 3300 feet above sea level.

B. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

2.3 POLYPHASE MOTORS

A. Description: NEMA MG 1, Design B, medium induction motor.

B. Efficiency: Energy efficient, in compliance with Energy Conservation Code of NYS, latest edition.

C. Service Factor: 1.15.

D. Multispeed Motors: Variable torque.
   1. For motors with 2:1 speed ratio, consequent pole, single winding.
   2. For motors with other than 2:1 speed ratio, separate winding for each speed.

E. Rotor: Random-wound, squirrel cage.

F. Bearings: Re-greasable, shielded, antifriction ball bearings suitable for radial and thrust loading.

G. Temperature Rise: Match insulation rating.

H. Insulation: Class F.

I. Code Letter Designation:
   1. Motors 15 HP and Larger: NEMA starting Code F or Code G.
   2. Motors Smaller than 15 HP: Manufacturer's standard starting characteristic.

J. Enclosure Material: Cast iron for motor frame sizes 324T and larger; rolled steel for motor frame sizes smaller than 324T.

2.4 POLYPHASE MOTORS WITH ADDITIONAL REQUIREMENTS

A. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.

B. Motors Used with Variable Frequency Controllers: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.
   1. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width modulated inverters.
   2. Energy- and Premium-Efficient Motors: Class B temperature rise; Class F insulation.
   3. Inverter-Duty Motors: Class F temperature rise; Class H insulation.

4. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.

2.5 SINGLE-PHASE MOTORS

A. Motors larger than 1/20 hp must be one of the following, to suit starting torque and requirements of specific motor application:
   1. Permanent-split capacitor.
   2. Split phase.
   3. Capacitor start, inductor run.
   4. Capacitor start, capacitor run.

B. Multispeed Motors: Variable-torque, permanent-split-capacitor type.

C. Bearings: Pre-lubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.

D. Motors 1/20 HP and Smaller: Shaded-pole type.

E. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device must automatically reset when motor temperature returns to normal range.

PART 3 - EXECUTION (Not Used).

END OF SECTION 23 05 13

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 23 05 29 - HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section Includes:
   1. Fastener systems.
   2. Equipment supports.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication and installation details for the following: include Product Data for components:
   1. Equipment supports.

C. Welding certificates.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

C. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

1.6 WARRANTY

A. Manufacturer must provide warranty for a period of one year from substantial completion. Warranty must cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer’s written instructions for installation, operation and maintenance have been followed.

PART 2 - PRODUCTS

2.1 FASTENER SYSTEMS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Hilti USA.
   2. Simpson Strong-Tie.
   3. Hohmann and Barnard, Inc.
   4. Tannerbolt, Inc.
   5. Or approved equal.

B. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

C. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated or stainless- steel anchors, for use in hardened Portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.2 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.3 ROOF PIPE SUPPORTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Miro Industries, Inc.
   2. PHP Systems.
   3. Rooftop Support Systems.
   4. Or approved equal.

B. A pipe support with "strut" used to support roof-mounted electrical conduit, condensate piping, gas pipes, and other mechanical piping. Unique design absorbs thermal expansion and contraction of pipes thus preventing damage to the roof membrane. The base is gently rounded to allow movement upon the roof to prevent gouging the roof membrane. Pipes rest on a strut system which is made of hot-dip galvanized steel. The pipe support base is made of polycarbonate resin, and all other metal parts are made of hot-dip galvanized or stainless steel. Pipe stand must accommodate up to 2 1/2" pipe (inside diameter) or up to 3" (outside diameter) pipes.

C. Provide deck plate beneath pipe stand. The deck plate is a rigid plate which supports other mechanical devices, pedestals or pipe supports by providing a flat smooth surface upon which supporting devices may rest to protect roof-top membranes and to further distribute roof top weight to protect sub-membrane insulation and decking material. The design of the deck plate allows rooftop pipe supports, pedestals and other supporting devices to be installed without penetrating the roof membrane and further allows the daily movement of a

piping system to properly carry the load being borne by the supporting devices as thermal expansion and contraction moves the roof system of pipes or devices supported by the deck plate. The deck plate must be constructed of minimum 18 gauge stainless steel plate which prevents rusting, enhances the longevity of the roof, and provides maximum operational efficiency for other rooftop pipe stands, pedestals and support devices.

2.4 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.

B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
   1. Properties: Non-staining, noncorrosive, and nongaseous.
   2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 HANGER AND SUPPORT INSTALLATION

A. Fastener System Installation:
   1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
   2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

B. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

C. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

D. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

E. Install lateral bracing with pipe hangers and supports to prevent swaying.

F. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

G. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

3.3 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make bearing surface smooth.

C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.4 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.5 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Trim excess length of continuous-thread hanger and support rods to 1 inch.

3.6 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.

B. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified.

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.7 HANGER AND SUPPORT SCHEDULE

A. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
   2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
   3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
   4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
   5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
   6. C-Clamps (MSS Type 23): For structural shapes.
   7. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:
      a. Light (MSS Type 31): 750 lb.
      b. Medium (MSS Type 32): 1500 lb.
      c. Heavy (MSS Type 33): 3000 lb.
   8. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
   9. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.

B. Use mechanical-expansion anchors instead of building attachments where required in concrete construction. Use of powder actuated anchors must be confirmed with Commissioner.

END OF SECTION 23 05 29

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 23 05 48.13 - VIBRATION CONTROLS FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. This Section includes the following:
1. Isolation pads.
2. Restrained spring isolators.
3. Elastomeric hangers.
4. Spring hangers.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each product indicated.

B. Engineering Services Submittal: For vibration isolation and seismic-restraint calculations and details indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer licensed in the State of New York responsible for their preparation.

C. Welding certificates.

D. Field quality-control test reports.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.6 WARRANTY

A. Manufacturer must provide warranty for a period of one year from substantial completion. Warranty must cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer’s written instructions for installation, operation and maintenance have been followed.

PART 2 - PRODUCTS

2.1 VIBRATION ISOLATORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Kinetics Noise Control.
   2. Mason Industries.
   3. Vibration Eliminator Co., Inc.
   4. Vibration Mountings & Controls, Inc.
   5. Or approved equal.

B. Pads (MWP): Arranged in single or multiple layers of sufficient stiffness for uniform loading over pad area, molded with a nonslip pattern and galvanized-steel baseplates, and factory cut to sizes that match requirements of supported equipment.
   1. Resilient Material: Oil- and water-resistant neoprene.

C. Elastomeric Hangers (NH): Double-deflection type, fitted with molded, oil-resistant elastomeric isolator elements bonded to steel housings with threaded connections for hanger rods. Color-code or otherwise identify to indicate capacity range.
   1. The diameter of the clear hole in the hanger box must be at least 3/4 inch larger than the diameter of the hanger rod and permit the hanger rod to swing through a 30 degree arc. When installed, the hanger box must be allowed to rotate through a full 360 degrees without encountering any obstructions. Neoprene must be bridge-bearing quality with a maximum durometer (Shore A scale) of 50.
   2. Neoprene must be bridge-bearing quality with a maximum durometer (Shore A scale) of 50.
   3. Unless otherwise specified, the static deflection of NH hangers must be 0.25 inches with a strain not exceeding 12.5%.

D. Spring Hangers (SPNH): Combination coil-spring and elastomeric-insert hanger with spring and insert in compression.
   1. Frame: Steel, fabricated for connection to threaded hanger rods and to allow for a maximum of 30 degrees of angular hanger-rod misalignment without binding or reducing isolation efficiency.
   2. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
   3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
   4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
   5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
   6. Elastomeric Element: Molded, oil-resistant rubber or neoprene. Steel-washer-reinforced cup to support spring and bushing projecting through bottom of frame.
   7. Self-centering hanger rod cap to ensure concentricity between hanger rod and support spring coil.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 VIBRATION-CONTROL DEVICE INSTALLATION

A. Comply with requirements in installation of equipment supports.

B. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

C. Drilled-in Anchors:
1. Identify the position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the Commissioner if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid pre-stressed tendons, electrical and telecommunications conduit, and gas lines.
2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors must be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
4. Set anchors to manufacturer's recommended torque, using a torque wrench.
5. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:
1. Obtain Commissioner's approval before transmitting test loads to structure. Provide temporary load-spreading members.
2. Test to 90 percent of rated proof load of device.
3. Measure isolator deflection.
4. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.

C. Prepare test and inspection reports.

3.4 HVAC VIBRATION-CONTROL SCHEDULE

A. As indicated below unless otherwise noted on plans.

Equipment Name & Tag	Location	Isolator Type	Base Type	Min Deflection
Air handling Units	Attic	Spring Isola-tors	Plywood Base	2- inch deflection

Air Cooled Condenser	Outdoors, Grade Level	Neoprene Isolation Pad	Isolation Rail anchored to Concrete Pad	0.25 inch deflection, strain not exceeding 12.5%
Heat Pump Condensing Unit	Outdoors, Grade Level	Neoprene Isolation Pad	Isolation Rail anchored to Concrete Pad	0.25 inch deflection, strain not exceeding 12.5%
Air Handling Unit	Basement	Neoprene Isolation Pad	Concrete Pad	0.25 inch deflection, strain not exceeding 12.5%
Fans	Attic	Spring Isolators	Plywood Base	0.25 inch deflection, strain not exceeding 12.5%
Indoor AC units	Floor Mount	Neoprene Isolation Pad	Concrete Pad on Floor Slab	0.25 inch deflection, strain not exceeding 12.5%
Indoor AC Units	Ceiling Hung	Spring and Neoprene Hangers	Ceiling Slab	1- inch static deflection

END OF SECTION 23 05 48.13

SECTION 23 05 53 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section Includes:
1. Equipment labels.
2. Warning signs and labels.
3. Duct labels.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.6 WARRANTY

A. Manufacturer must provide warranty for a period of one year from substantial completion. Warranty must cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer’s written instructions for installation, operation and maintenance have been followed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products by one the following:
1. Seton.
2. DuraMark Technolgies.
3. Marking Services Incorporated.
4. Or approved equal.

2.2 EQUIPMENT LABELS

A. Metal Labels for Equipment:
   1. Material and Thickness: Brass, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
   2. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
   3. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
   4. Fasteners: Stainless-steel rivets or self-tapping screws.
   5. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Plastic Labels for Equipment:
   1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
   2. Letter Color: White
   3. Background Color: Black
   4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
   5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
   6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
   7. Fasteners: Stainless-steel rivets or self-tapping screws.
   8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.

D. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule must be included in operation and maintenance data.

2.3 WARNING SIGNS AND LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.

B. Letter Color: Red.

C. Background Color: White.

D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

G. Fasteners: Stainless-steel rivets or self-tapping screws.

H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

I. Label Content: Include caution and warning information, plus emergency notification instructions.

2.4 DUCT LABELS

A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.

B. Letter Color: Refer to color schedule below.

C. Background Color: White.

D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.

E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.

G. Fasteners: Stainless-steel rivets or self-tapping screws.

H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

I. Duct Label Contents: Include identification of duct service using same designations or abbreviations as used on Drawings, duct size, and an arrow indicating flow direction.
   1. Flow-Direction Arrows: Integral with duct system service lettering to accommodate both directions, or as separate unit on each duct label to indicate flow direction.
   2. Lettering Size: At least 1-1/2 inches high.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.3 EQUIPMENT LABEL INSTALLATION

A. Install or permanently fasten labels on each major item of mechanical equipment.

B. Locate equipment labels where accessible and visible.

3.4 DUCT LABEL INSTALLATION

A. Install plastic-laminated or self-adhesive duct labels with permanent adhesive on air ducts in the following color codes:
   1. Black lettering on white background.
   2. ASME A13.1 Colors and Designs: For hazardous material exhaust.

B. Locate labels near points where ducts enter into concealed spaces and at maximum intervals of 20 feet in each space where ducts are exposed or concealed by removable ceiling system.

END OF SECTION 23 05 53

SECTION 23 05 93 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section Includes:
   1. Balancing Air Systems:
      a. Variable-volume air systems.
      b. Constant air volume systems.

1.3 DEFINITIONS

A. AABC: Associated Air Balance Council.

B. NEBB: National Environmental Balancing Bureau.

C. TAB: Testing, adjusting, and balancing.

D. TABB: Testing, Adjusting, and Balancing Bureau.

E. TAB Specialist: An entity engaged to perform TAB Work.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.5 SUBMITTALS

A. Strategies and Procedures Plan: Within 30 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.

B. Certified TAB reports.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. TAB subcontractor qualifications: Engage a TAB entity certified by AABC, NEBB or TABB.

1. TAB Technician: Employee of the TAB subcontractor and who is certified by AABC, NEBB or TABB as a TAB technician.

C. Certify TAB field data reports and perform the following:
   1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
   2. Certify that the TAB team complied with the approved TAB plan and the procedures specified and referenced in this Specification.

D. TAB Report Forms: Use standard TAB subcontractor's forms approved by Commissioner.

E. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

1.7 GUARANTEE

A. Provide guarantee for a period of one year from substantial completion. Guarantee must cover workmanship that prove defective, within the specified guarantee period, provided no changes have been made in installation, operation and maintenance have been followed.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.

B. Examine systems for installed balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, and manual volume dampers. Verify that locations of these balancing devices are accessible.

C. Examine the approved submittals for HVAC systems and equipment.

D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements about HVAC system and equipment controls.

E. Examine ceiling plenums used for return air to verify that they meet the leakage class of connected ducts as specified in Section 233113 "Metal Ducts" and are properly separated from adjacent areas. Verify that penetrations in plenum walls are sealed and fire-stopped if required.

F. Examine equipment performance data including fan curves.
   1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
   2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.

G. Examine system and equipment installations and verify that field quality control testing, cleaning, and adjusting specified in individual Sections have been performed.

H. Examine test reports specified in individual system and equipment Sections.

I. Examine HVAC equipment and filters and verify that bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.

J. Examine operating safety interlocks and controls on HVAC equipment.

K. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.3 PREPARATION

A. Prepare a TAB plan that includes strategies and step-by-step procedures.

B. Complete system-readiness checks and prepare reports. Verify the following:
   1. Permanent electrical-power wiring is complete.
   2. Automatic temperature-control systems are operational.
   3. Equipment and duct access doors are securely closed.
   4. Balance, smoke, and fire dampers are open.
   5. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
   6. Windows and doors can be closed so indicated conditions for system operations can be met.

3.4 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance" or “SMACNA's "HVAC Systems - Testing, Adjusting, and Balancing" and in this Section.
   1. Comply with requirements in ASHRAE 62.1-2004, Section 7.2.2, "Air Balancing."

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.

1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
2. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Section 230700 "HVAC Insulation."

C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.

D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.5 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.

B. Prepare schematic diagrams of systems' "as-built" duct layouts.

C. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.

D. Check airflow patterns from the outdoor-air louvers and dampers and the return- and exhaust-air dampers through the supply-fan discharge and mixing dampers.

E. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

F. Verify that motor starters are equipped with properly sized thermal protection.

G. Check dampers for proper position to achieve desired airflow path.

H. Check for airflow blockages.

I. Check condensate drains for proper connections and functioning.

J. Check for proper sealing of air-handling-unit components.

K. Verify that air duct system is sealed as specified in Section 233113 "Metal Ducts."

3.6 PROCEDURES FOR VARIABLE-AIR-VOLUME SYSTEMS

A. Compensating for Diversity: When the total airflow of all terminal units is more than the indicated airflow of the fan, place a selected number of terminal units at a minimum set-point airflow with the remainder at maximum airflow condition until the total airflow of the terminal units equals the indicated airflow of the fan. Select the reduced-airflow terminal units so they are distributed evenly among the branch ducts.

B. Pressure-Independent, Variable-Air-Volume Systems: After the fan systems have been adjusted, adjust the variable-air-volume systems as follows:

1. Set outdoor-air dampers at minimum, and set return- and exhaust-air dampers at a position that simulates full-cooling load.
2. Select the terminal unit that is most critical to the supply-fan airflow and static pressure. Measure static pressure. Adjust system static pressure so the entering static pressure for the critical terminal unit is not less than the sum of the terminal-unit manufacturer's recommended minimum inlet static pressure plus the static pressure needed to overcome terminal-unit discharge system losses.
3. Measure total system airflow. Adjust to within indicated airflow.
4. Set terminal units at maximum airflow and adjust controller or regulator to deliver the designed maximum airflow. Use terminal-unit manufacturer's written instructions to make this adjustment. When total airflow is correct, balance the air outlets downstream from terminal units the same as described for constant-volume air systems.
5. Set terminal units at minimum airflow and adjust controller or regulator to deliver the designed minimum airflow. Check air outlets for a proportional reduction in airflow the same as described for constant-volume air systems.

    a. If air outlets are out of balance at minimum airflow, report the condition but leave outlets balanced for maximum airflow.

6. Re-measure the return airflow to the fan while operating at maximum return airflow and minimum outdoor airflow.

    a. Adjust the fan and balance the return-air ducts and inlets the same as described for constant-volume air systems.

7. Measure static pressure at the most critical terminal unit and adjust the static-pressure controller at the main supply-air sensing station to ensure that adequate static pressure is maintained at the most critical unit.
8. Record final fan-performance data.

3.7 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.
    1. Measure total airflow.
        a. Where sufficient space in ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow.
    2. Measure fan static pressures as follows to determine actual static pressure:
        a. Measure outlet static pressure as far downstream from the fan as practical and upstream from restrictions in ducts such as elbows and transitions.
        b. Measure static pressure directly at the fan outlet or through the flexible connection.
        c. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from the flexible connection, and downstream from duct restrictions.
        d. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.

3. Measure static pressure across each component that makes up an air-handling unit, rooftop unit, and other air-handling and -treating equipment.
   a. Report the cleanliness status of filters and the time static pressures are measured.
4. Measure static pressures entering and leaving other devices, such as sound traps, heat-recovery equipment, and air washers, under final balanced conditions.
5. Review Record Documents to determine variations in design static pressures versus actual static pressures. Calculate actual system-effect factors. Recommend adjustments to accommodate actual conditions.
6. Obtain approval from Commissioner for adjustment of fan speed higher or lower than indicated speed. Comply with requirements in Division 23 Sections for air-handling units for adjustment of fans, belts, and pulley sizes to achieve indicated air-handling-unit performance.
7. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload will occur. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.

B. Adjust volume dampers for main duct, sub-main ducts, and major branch ducts to indicated airflows within specified tolerances.
   1. Measure airflow of sub-main and branch ducts.
      a. Where sufficient space in sub-main and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.
   2. Measure static pressure at a point downstream from the balancing damper, and adjust volume dampers until the proper static pressure is achieved.
   3. Re-measure each sub-main and branch duct after all have been adjusted. Continue to adjust sub-main and branch ducts to indicated airflows within specified tolerances.

C. Measure air outlets and inlets without making adjustments.
   1. Measure terminal outlets using a direct-reading hood or outlet manufacturer's written instructions and calculating factors.

D. Adjust air outlets and inlets for each space to indicated airflows within specified tolerances of indicated values. Make adjustments using branch volume dampers rather than extractors and the dampers at air terminals.
   1. Adjust each outlet in same room or space to within specified tolerances of indicated quantities without generating noise levels above the limitations prescribed by the Contract Documents.
   2. Adjust patterns of adjustable outlets for proper distribution without drafts.

3.8 PROCEDURES FOR MOTORS

A. Motors, 1/2 HP and Larger: Test at final balanced conditions and record the following data:
   1. Manufacturer's name, model number, and serial number.
   2. Motor horsepower rating.
   3. Motor rpm.
   4. Efficiency rating.

5. Nameplate and measured voltage, each phase.
6. Nameplate and measured amperage, each phase.
7. Starter thermal-protection-element rating.

B. Motors Driven by Variable-Frequency Controllers: Test for proper operation at speeds varying from minimum to maximum. Test the manual bypass of the controller to prove proper operation. Record observations including name of controller manufacturer, model number, serial number, and nameplate data.

3.9 TOLERANCES

A. Set HVAC system's air flow rates and water flow rates within the following tolerances:
1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus or minus 10 percent.
2. Air Outlets and Inlets: Plus or minus 10 percent.
3. Heating-Water Flow Rate: Plus or minus 10 percent.

3.10 REPORTING

A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

3.11 FINAL REPORT

A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.
1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
2. Include a list of instruments used for procedures, along with proof of calibration.

B. Final Report Contents: In addition to certified field-report data, include the following:
1. Pump curves.
2. Fan curves.
3. Manufacturers' test data.
4. Field test reports prepared by system and equipment installers.
5. Other information relative to equipment performance; do not include Shop Drawings and product data.

C. General Report Data: In addition to form titles and entries, include the following data:
1. Title page.
2. Name and address of the TAB subcontractor.
3. Project name.
4. Project location.
5. Architect's name and address.
6. Engineer's name and address.

7. Contractor's name and address.
8. Report date.
9. Signature of TAB supervisor who certifies the report.
10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
11. Summary of contents including the following:
    a. Indicated versus final performance.
    b. Notable characteristics of systems.
    c. Description of system operation sequence if it varies from the Contract Documents.
12. Nomenclature sheets for each item of equipment.
13. Data for terminal units, including manufacturer's name, type, size, and fittings.
14. Notes to explain why certain final data in the body of reports vary from indicated values.
15. Test conditions for fans and pump performance forms including the following:
    a. Settings for outdoor-, return-, and exhaust-air dampers.
    b. Conditions of filters.
    c. Cooling coil, wet- and dry-bulb conditions.
    d. Face and bypass damper settings at coils.
    e. Fan drive settings including settings and percentage of maximum pitch diameter.
    f. Inlet vane settings for variable-air-volume systems.
    g. Settings for supply-air, static-pressure controller.
    h. Other system operating conditions that affect performance.

D. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:
1. Quantities of outdoor, supply, return, and exhaust airflows.
2. Duct, outlet, and inlet sizes.
3. Terminal units.

3.12 ADDITIONAL TESTS

A. Within 90 days of completing TAB, perform additional TAB to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

B. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional TAB during near-peak summer and winter conditions.

END OF SECTION 23 05 93

SECTION 23 07 00 - HVAC INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section Includes:

1. Insulation Materials:
   a. Mineral fiber.
2. Insulating cements.
3. Adhesives.
4. Mastics.
5. Sealants.
6. Factory-applied jackets.
7. Field-applied fabric-reinforcing mesh.
8. Field-applied jackets.
9. Tapes.
10. Securements.
11. Corner angles.

1.3 RELATED SECTIONS:

A. Section 233113 - Metal Ducts

B. Section 232300 - Refrigerant Piping

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings:

1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
2. Detail insulation application at pipe expansion joints for each type of insulation.
3. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.

4. Detail removable insulation at piping specialties, equipment connections, and access panels.
5. Detail application of field-applied jackets.

C. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Fire-Test-Response Characteristics: Insulation and related materials must have fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing and inspecting agency.

1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.7 WARRANTY

A. Manufacturer must provide warranty for a period of one year for substantial completion. Warranty must cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer’s written instructions for installation, operation and maintenance have been followed.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. CertainTeed Corp.; Duct Wrap.
2. Johns Manville; Microlite.
3. Knauf Insulation; Duct Wrap.
4. Owens Corning.
5. Or approved equal

B. Comply with requirements in Part 3 schedule articles for where insulating materials must be applied.

C. Products must not contain asbestos, lead, mercury, or mercury compounds.

D. Products that come in contact with stainless steel must have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

E. Insulation materials for use on austenitic stainless steel must be qualified as acceptable according to ASTM C 795.

F. Foam insulation materials must not use CFC or HCFC blowing agents in the manufacturing process.

G. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type I with factory-applied ASJ jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

2.2 REFRIGERANT PIPING INSULATION

A. Refer to specification Section 232300 - Refrigerant Piping.

2.3 INSULATING CEMENTS

A. Products: Subject to compliance with requirements, provide one of the following:
1. Insulco, Division of MFS, Inc.; SmoothKote.
2. P. K. Insulation Mfg. Co., Inc.; PK No. 127, and Quik-Cote.
3. Rock Wool Manufacturing Company; Delta One Shot.
4. Or approved equal.

B. Mineral-fiber, hydraulic-setting cement is suitable for temperatures from 100 to 1200 deg F (38 to 649 deg C) and for a smooth surface.

C. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449/C 449M.

2.4 ADHESIVES

A. Products: Subject to compliance with requirements, provide one of the following:
1. Childers Products, Division of ITW; CP-82.
2. Foster Products Corporation, H. B. Fuller Company; 85-20.
3. ITW TACC, Division of Illinois Tool Works; S-90/80.
4. Marathon Industries, Inc.; 225.
5. Mon-Eco Industries, Inc.; 22-25.
6. Or approved equal.

B. Materials must be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.

C. Mineral-Fiber Adhesive: Comply with Class 2, Grade A.

1. For indoor applications, use adhesive that has a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

D. ASJ Adhesive: Comply with Class 2, Grade A for bonding insulation jacket lap seams and joints.

E. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.5 MASTICS

A. Products: Subject to compliance with requirements, provide one of the following:
   1. Childers Products, Division of ITW; CP-35.
   2. Foster Products Corporation, H. B. Fuller Company; 30-90.
   3. ITW TACC, Division of Illinois Tool Works; CB-50.
   4. Marathon Industries, Inc.; 590.
   5. Mon-Eco Industries, Inc.; 55-40.
   6. Vimasco Corporation; 749.
   7. Or approved equal.

B. Materials must be compatible with insulation materials, jackets, and substrates.

   1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Vapor-Barrier Mastic: Water based; suitable for indoor and outdoor use on below ambient services.

   1. Water-Vapor Permeance: ASTM E 96, Procedure B, 0.013 perm at 43-mil dry film thickness.
   2. Service Temperature Range: Minus 20 to plus 180 deg F
   3. Solids Content: ASTM D 1644, 59 percent by volume and 71 percent by weight.
   4. Color: White.

D. Breather Mastic: Water based; suitable for indoor and outdoor use on above ambient services.

   1. Products: Subject to compliance with requirements, provide one of the following:

      a. Childers Products, Division of ITW; CP-10.
      b. Foster Products Corporation, H. B. Fuller Company; 35-00.
      c. ITW TACC, Division of Illinois Tool Works; CB-05/15.
      d. Marathon Industries, Inc.; 550.
      e. Mon-Eco Industries, Inc.; 55-50.
      f. Vimasco Corporation; WC-1/WC-5.
      g. Or approved equal.

   2. Water-Vapor Permeance: ASTM F 1249, 3 perms at 0.0625-inch dry film thickness.
   3. Service Temperature Range: Minus 20 to plus 200 deg F
   4. Solids Content: 63 percent by volume and 73 percent by weight.
   5. Color: White.

2.6 SEALANTS

A. Joint Sealants for Cellular Glass:

   1. Products: Subject to compliance with requirements, provide one of the following:

      a. Childers Products, Division of ITW; CP-76.
      b. Foster Products Corporation, H. B. Fuller Company; 30-45.

c. Marathon Industries, Inc.; 405.
d. Mon-Eco Industries, Inc.; 44-05.
e. Pittsburgh Corning Corporation; Pittseal 444.
f. Vimasco Corporation; 750.
g. Or approved equal.

B. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:

1. Products: Subject to compliance with requirements, provide one of the following:

a. Childers Products, Division of ITW; CP-76.
b. Foster Products Corporation, H. B. Fuller Company; 95-44.
c. Vimasco Corporation; 750.
d. Or approved equal.

2. Materials must be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F
5. Color: White.
6. For indoor applications, use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.7 FACTORY-APPLIED JACKETS

A. Products: Subject to compliance with requirements, provide one of the following:

1. CertainTeed Corp.; Duct Wrap.
2. Johns Manville; Microlite.
3. Knauf Insulation; Duct Wrap.
4. Or approved equal.

B. For insulation materials with factory-applied jackets for use on applications above 140 deg F, specify sufficient insulation thickness to maintain outer surface temperature of insulation below 140 deg F. 140 deg F surface temperature is set by OSHA for personnel protection.

C. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.

2.8 FIELD-APPLIED FABRIC-REINFORCING MESH

A. Woven Polyester Fabric: Approximately 1 oz./sq. yd. with a thread count of 10 strands by 10 strands/sq. inch in a Leno weave, for duct, equipment, and pipe.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Foster Products Corporation, H. B. Fuller Company; Mast-A-Fab.
b. Vimasco Corporation; Elastafab 894.
c. Proto PVC Corporation; LoSmoke
d. Or approved equal

2.9 FIELD-APPLIED JACKETS

A. Products: Subject to compliance with requirements, provide one of the following:
1. Childers Products, Division of ITW; Metal Jacketing Systems.
2. PABCO Metals Corporation; Surefit.
3. RPR Products, Inc.; Insul-Mate.
4. Or approved equal

B. Field-applied jackets must comply with ASTM C 921, Type I, unless otherwise indicated.

C. Aluminum Jacket: Comply with ASTM B 209 Alloy 3003, 3005, 3105 or 5005, Temper H-14.

1. Sheet and roll stock ready for shop or field sizing or Factory cut and rolled to size.
2. Finish and thickness are indicated in field-applied jacket schedules.

D. Moisture Barrier
1. Moisture Barrier for Indoor Applications: 3-mil- thick, heat-bonded polyethylene and kraft paper.
2. Moisture Barrier for Outdoor Applications: 3-mil- thick, heat-bonded polyethylene and kraft paper.

E. Factory-Fabricated Fitting Covers:
1. Same material, finish, and thickness as jacket.
2. Preformed 2-piece or gore, 45- and 90-degree, short- and long-radius elbows.
3. Tee covers.
4. Flange and union covers.
5. End caps.
6. Beveled collars.
7. Valve covers.
8. Field fabricate fitting covers only if factory-fabricated fitting covers are not available.

2.10 TAPES

A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0835.
b. Compac Corp.; 104 and 105.
c. Ideal Tape Co., Inc., an American Biltrite Company; 428 AWF ASJ.
d. Venture Tape; 1540 CW Plus, 1542 CW Plus, and 1542 CW Plus/SQ.
e. Or approved equal

2. Width: 3 inches

3. Thickness: 11.5 mils
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

2.11 SECUREMENTS

A. Aluminum Bands: ASTM B 209 Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 1/2 inch wide with wing or closed seal.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Childers Products.
b. PABCO Metals Corporation.
c. RPR Products, Inc.
d. Or approved equal.

B. Insulation Pins and Hangers:

1. Nonmetal, Adhesively Attached, Perforated-Base Insulation Hangers: Baseplate fastened to projecting spindle that is capable of holding insulation, of thickness indicated, securely in position indicated when self-locking washer is in place. Comply with the following requirements:

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) GEMCO.
2) Midwest Fasteners, Inc.
3) Ideal Tape Co.
4) Or approved equal.

b. Baseplate: Perforated, nylon sheet, 0.030 inch thick by 1-1/2 inches in diameter.
c. Spindle: Nylon, 0.106-inch- diameter shank, length to suit depth of insulation indicated, up to 2-1/2 inches
d. Adhesive: Recommended by hanger manufacturer. Product with demonstrated capability to bond insulation hanger securely to substrates indicated without damaging insulation, hangers, and substrates.

2. Nonmetal Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick nylon sheet, with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.

a. Manufacturer: Subject to compliance with requirements, provide products by one of the following:

1) GEMCO.
2) Midwest Fasteners, Inc.
3) Ideal Tape Co.

4) Or approved equal.

C. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.

D. Wire: 0.080-inch nickel-copper alloy or 0.062-inch soft-annealed, stainless steel.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. C & F Wire.
b. Childers Products.
c. PABCO Metals Corporation.
d. RPR Products, Inc.
e. Or approved equal.

2.12 CORNER ANGLES

A. Aluminum Corner Angles: 0.040 inch thick, minimum 1 by 1 inch, aluminum according to ASTM B 209 (ASTM B 209M), Alloy 3003, 3005, 3105 or 5005; Temper H-14.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment, ducts and fittings, and piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment, duct system, and pipe system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during application and finishing.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.

1. Install insulation continuously through hangers and around anchor attachments.
2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

L. Install insulation with factory-applied jackets as follows:

1. Draw jacket tight and smooth.
2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
3. Overlap jacket longitudinal seams at least 1-1/2 inches Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches o.c.

   a. For below ambient services, apply vapor-barrier mastic over staples.

4. Cover joints and seams with tape as recommended by insulation material manufacturer to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct and pipe flanges and fittings.

M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

N. Finish installation with systems at operating conditions. Repair and restore joint separations and cracking due to thermal movement.

O. Repair and restore damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

P. For above ambient services, do not install insulation to the following:

1. Vibration-control devices.
2. Testing agency labels and stamps.
3. Nameplates and data plates.
4. Manholes.
5. Handholes.
6. Cleanouts.

3.4 PENETRATIONS

A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.

1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
4. Seal jacket to roof flashing with flashing sealant.

B. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

C. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions. Terminate insulation at fire damper sleeves for fire-rated wall and partition penetrations. Externally insulate damper sleeves to match adjacent insulation and overlap duct insulation at least 2 inches

3.5 MINERAL-FIBER INSULATION INSTALLATION

A. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.

1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 50 percent coverage of duct and plenum surfaces.
2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:

a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.

b. On duct sides with dimensions larger than 18 inches, place pins 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
d. Do not over compress insulation during installation.
e. Impale insulation over pins and attach speed washers.
f. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.

4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from 1 edge and 1 end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.

   a. Repair and restore punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
   b. Install vapor stops for ductwork and plenums operating below 50 deg F at 18-foot intervals. Vapor stops must consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to 2 times the insulation thickness but not less than 3 inches

5. Overlap unfaced blankets a minimum of 2 inches on longitudinal seams and end joints. At end joints, secure with steel bands spaced a maximum of 18 inches o.c.
6. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
7. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch- wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

3.6 FIELD-APPLIED JACKET INSTALLATION

A. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

3.7 FINISHES

A. Duct, Equipment, and Pipe Insulation with ASJ or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in Division 09 painting Section.

1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.

   a. Finish Coat Material: Interior, flat, latex-emulsion size.

B. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.

C. Color: Final color as selected by Commissioner. Vary first and second coats to allow visual inspection of the completed Work.

D. Do not field paint aluminum or stainless-steel jackets.

3.8 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Inspect ductwork, randomly selected by Commissioner, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection must be limited to two location(s) for each duct system defined in the "Duct Insulation Schedule, General" Article.
2. Inspect pipe, fittings, strainers, and valves, randomly selected by Commissioner, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection must be limited to three locations of straight pipe, three locations of threaded fittings, two locations of threaded strainers, two locations of threaded valves, and two locations of flanged valves for each pipe service defined in the "Piping Insulation Schedule, General" Article.

C. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.9 DUCT INSULATION SCHEDULE, GENERAL

A. Plenums and Ducts Requiring Insulation:

1. Indoor, concealed or exposed supply and outdoor air.
2. Indoor, concealed or exposed return located in non-conditioned space.
3. Indoor, concealed or exposed exhaust between isolation damper and penetration of building exterior.
4. Outdoor, concealed or exposed supply and return.

B. Items Not Insulated:
1. Metal ducts with duct liner of sufficient thickness to comply with the 2014 NYC Energy Conservation Code.
2. Factory-insulated flexible ducts.
3. Factory-insulated plenums and casings.
4. Flexible connectors.
5. Vibration-control devices.
6. Factory-insulated access panels and doors.

3.10 INDOOR DUCT AND PLENUM INSULATION SCHEDULE

A. All ductwork insulation performance (R value) and thickness must be in compliance with the 2020 NYC Energy Conservation Code. Refer to drawings for code required R -values.

3.11 PIPING INSULATION SCHEDULE, GENERAL

A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
   1. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.12 INDOOR PIPING INSULATION SCHEDULE

A. Refrigerant Piping: Refer to specification Section 232300 “Refrigerant Piping”.

B. AC Condensate:
   1. Mineral-Fiber, Preformed Pipe, Type I: 1-inches thick.
   2. Flexible Elastomeric: 1 inch thick

3.13 OUTDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

B. Provide watertight jacketing with weatherproofing.

C. Piping & Ductwork Exposed:
   1. Aluminum

END OF SECTION 23 07 00

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 23 08 00 - COMMISSIONING OF HVAC

PART I – GENERAL

1.1. RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2. SUMMARY

A. Commissioning consists of systematically documenting that specified components and systems have been installed and started up properly and then functionally tested to verify and document proper operation through all sequences of operation and conditions. In addition, instruction of the City of New York's operations personnel must be verified and final project O&M Documents must be reviewed for completeness.

1.3. QUALITY ASSURANCE

A. Reference Standards:

1. OSHA Part 1910; Subpart S. 1910.308.
2. American National Standards Institute: ANSI
3. American Society for Testing and Materials: ASTM
4. National Electrical Manufacturers Association: NEMA
5. National Fire Protection Association: NFPA
6. American Society of Heating, Refrigerating and Air-Conditioning Engineers: ASHRAE

B. All inspections and tests must use the following references.

1. Contract Specifications.
2. Contract Drawings.
3. Manufacturer's instruction manuals and approved shop drawings for applicable equipment.

PART II – PRODUCTS

2.1. EQUIPMENT AND INSTRUMENTS FOR Cx PROCESS

A. The Contractor must furnish all tools, instruments, laptops, calibrated meters, software programs, personnel, and services required to perform the commissioning process. This includes providing the connection to systems to be tested, temporary alterations for test purposes, calibrations, operation of the test equipment & instrumentation and generating test results (as required), and the restoration of equipment/systems to original operating condition. A list of all tools and equipment to be used during commissioning must be submitted to the CxA for approval. The Contractor must furnish necessary utilities for the commissioning process.

B. Proprietary test equipment and software required by any equipment manufacturer for programming and/or start-up, whether specified or not, must be provided by the manufacturer of the equipment. Proprietary test equipment (and software) must become the property of the City

of New York upon completion of the commissioning process.

2.2. COMMISSIONING DOCUMENTATION

A. All documentation for the commissioning process must be entered into the CxA's commissioning project progress tracking software tool. The Contractor must be allowed web-based access to the software upon request. Additionally, the Contractor may download the CxA's mobile application to a tablet format. The mobile application is available in Apple, Android, and Windows format. There is no fee associated with the software or the mobile application. The Contractor must allow sufficient time to familiarize themselves with the operation of the software.

PART III – EXECUTION

3.1. GENERAL

A. The Contractor must complete all phases of work so the systems can be started, tested, balanced, and acceptance procedures undertaken. This includes the complete installation of all equipment, materials, pipe, duct, wire, insulation, controls, etc., per the Contract Documents and related directives, clarifications, and change orders.

3.2. PARTICIPATION IN ACCEPTANCE PROCEDURES

A. The Contractor must provide skilled technicians to startup and debug all systems within the project contracted work. These same technicians must be made available to assist the CxA in completing the commissioning program. Work schedules, time required for testing, etc., must be requested by the CxA and coordinated by the Contractor. The Contractor must ensure that the qualified technician(s) are available and present during the agreed upon schedules and of sufficient duration to complete the necessary tests, adjustments, and/or problem resolutions.

B. System performance problems and discrepancies may require additional technician time, CxA time, reconstruction of systems, and/or replacement of system components. At no additional cost to the City of New York, the additional technician time must be made available for subsequent commissioning periods until the required system performance is obtained.

C. The CxA reserves the right to question the appropriateness and qualifications of the technicians relative to each item of equipment, system, and/or sub-system. Qualifications of technicians must include expert knowledge relative to the specific equipment involved and a willingness to work with the CxA. The Contractor must provide adequate documentation and tools to start-up and test the equipment, system, and/or sub-system.

3.3. DEFICIENCY RESOLUTION

A. In some systems, inaccurate adjustments, misapplied equipment, and/or deficient performance under varying loads must result in additional work being required to commission the systems. This work must be completed under the direction of the Commissioner, with input from the Contractor, equipment manufacturer, and CxA. Whereas all members must have input and the opportunity to discuss, debate, and work out problems, the Commissioner must have final jurisdiction over any additional work done to achieve performance.

B. Corrective work must be completed in a timely fashion to permit the completion of the commissioning process. Experimentation to demonstrate system performance may be permitted. If the CxA deems the experimentation work to be ineffective or untimely as it relates to the commissioning process, the CxA must notify the Commissioner, indicating the nature of the problem, expected steps to be taken, and suggested deadline(s) for completion of activities. If the deadline(s) pass without resolution of the problem, the Commissioner reserves the right to obtain supplementary services and/or equipment to resolve the problem. The Contractor must provide supplementary services incurred to solve problems at no additional cost to the City of New York.

3.4. ADDITIONAL COMMISSIONING

A. Additional commissioning activities may be required after system adjustments, replacements, etc., are completed. The Contractor, suppliers, and CxA must complete this work at no additional cost to the City of New York.

3.5. SEASONAL COMMISSIONING

A. Seasonal commissioning pertains to testing under full load conditions during peak heating and peak cooling seasons, as well as part load conditions in the spring and fall. Initial commissioning must be done as soon as contract work is completed, regardless of season. Subsequent commissioning may be undertaken at any time thereafter to ascertain adequate performance during the different seasons.

3.6. SUSTAINING SYSTEM READINESS

A. The CxA must prepare and issue to the Contractor Pre-Functional Checklist (PFC) forms for each system or major piece of equipment to be commissioned. Pre-Functional Checklists are important to ensure that the equipment and systems are installed and operational. It ensures that Functional Performance and Integrated Systems Testing may proceed without unnecessary delays. Each piece of equipment is to receive full pre-functional checkout by the Contractor. No sampling strategies are to be used. The Pre-Functional Checklists for all equipment related to any given system must be successfully completed prior to formal Functional Performance and Integrated Systems Testing of the system.

B. The CxA must monitor and track the completion of the Pre-Functional Checklist forms.

C. The Contractor must complete the Pre-Functional Checklists, provided by the CxA, as follows:

1. Pre-Functional Checklists should be maintained in a binder(s) or electronically at the Contractor's project site office and are subject to review for comparison between the completion level of the Checklists and the status of the work during site observation visits by the CxA.

3. Complete Section 1 "Equipment Delivery" of the Pre-Functional Checklist after equipment delivery to the site.

4. Complete Section 2 "Equipment Installation" of the Pre-Functional Checklist after the equipment installation is complete.

5. Complete Section 3 "Equipment Start-up" of the Pre-Functional Checklist after the equipment has been successfully started. The Contractor is to forward copies of all manufacturer's start-up forms and reports to the CxA.

6. Complete Section 4 "BAS/Power Monitoring/Lighting Control Integration" of the Pre-Functional Checklist after the equipment and systems control configuration and integration process has been completed.

7. Complete Section 5 "Notification for Testing" of the Pre-Functional Checklist after the equipment if fully operational and ready for Functional Performance and Integrated Systems Testing.

8. Completed and signed Pre-Functional Checklists are a pre-requisite for commencing Functional Performance and Integrated Systems Testing. If field observation indicates a significant deviation from actual installation conditions, all checklists must be returned to the Contractor for revision and resubmission at no additional cost to the City.

9. Only individuals that have direct knowledge and witnessed that a line item task on the Pre-Functional Checklist was actually performed must initial or check off that item.

D. The Contractor must clearly list any outstanding items from the Pre-Functional Checklists and/or manufacturer start-up reports and checklists that were not completed successfully in the Comments section of the applicable Pre-Functional Checklist. The CxA must review any items/issues listed and must address them through discussion with the Commissioner and Contractor prior to proceeding with Functional Performance and Integrated Systems Testing.

E. The Contractor must develop detailed start-up plans for all equipment. These plans must be reviewed by the Commissioner and the CxA for completeness and verification that the manufacturer-recommended procedures have been completed.

1. The Contractor responsible for the installation and start-up of the equipment is responsible for developing the start-up plan by combining the Pre-Functional Checklist with the manufacturer's detailed start-up and checkout procedures and any required quality assurance testing.

2. The Contractor must maintain an updated and annotated copy of the start-up plan that must be accessible for review by the Commissioner and the CxA at periodic intervals.

3. The completed start-up procedures must be provided along with the completed Pre-Functional Checklists to the CxA prior to the Contractor's certification that the systems are ready for Functional Performance and Integrated Systems Testing.

3.7. FUNCTIONAL PERFORMANCE TESTING

A. The CxA must provide to the Contractor functional performance tests (FPTs). The Contractor must review the test procedures, so that proper preparation may occur. The Contractor must execute the FPT document and prove to the Commissioner's Representative and the CxA that the performance of the Mechanical Systems achieves the performance level identified. Refer to all other specification sections for other systems that may need to be tested. The following systems are to be commissioned but not limited to:

1. HVAC Systems:

a. Split System VRV Indoor AC Units

b. Split System VRV Condensing Units

c. Branch Selector Box

d. Air Handling Units

e. Split System Outdoor Condensing Units

f. Electric Duct Heaters

g. Electric Fan Heaters

h. Fans

B. Detailed testing must be performed on all installed equipment and systems to ensure that operation and performance conform to the Contract Documents. All tests must be witnessed by the CxA. The following testing is required as part of the commissioning process:

1. Verification tests are comprised of a full range of checks and tests to determine that all components, equipment, systems, and interfaces between systems operate in accordance with contract documents. This includes all operating modes, interlocks, control responses, and specific responses to abnormal or emergency conditions.
2. Functional performance tests (FPT) must determine if the HVAC system is providing the required cooling and heating services in accordance with the finalized design intent. These tests must also determine the installed capacity of the cooling and heating equipment, and the individual heat transfer components.

3.8. ROLES AND RESPONSIBILITIES

A. Contractor

1. Assure acceptable representation, with the means and authority to prepare and coordinate execution of the HVAC system commissioning program as described in the Contract Documents.
2. Attend commissioning meetings scheduled by the CxA.
3. Coordinate inclusion of commissioning activities in the construction schedule.
4. Complete Pre-Functional Checklists and manufacturer's pre-startup checklists prior to scheduling pre-testing of the HVAC system.
5. Issue a notice that HVAC pre-testing has been scheduled.
6. Monitor, respond, and remedy deficiencies identified in the Corrective Issue Reports (CIRs) distributed by the CxA in order to expedite corrective actions necessary to achieve design intent.
7. Facilitate resolution of deficiencies that were identified by observations or performance testing.
8. Participate in the Functional Performance Tests as required to achieve design intent.
9. Participate in O&M Instruction as required by DDC General Conditions Section 017839, Contract Record Documents and Section 019113 General Commissioning Requirements for MEP Systems.
10. Include requirements for submittal data, O&M data, and instruction in each purchase order or sub-contract written.
11. Ensure cooperation and participation of the trades such as sheet metal, piping, refrigeration, water treatment, and TAB.
12. Ensure participation of major equipment manufacturers in appropriate instruction and testing activities.
13. Attend Construction Phase coordination meeting scheduled by the CxA.
14. Assist the CxA in all verification and functional performance tests.
15. Prepare preliminary schedule and include the following tasks that must be executed: mechanical system orientation and inspections, O&M manual submission, instruction sessions, pipe and duct system testing, flushing and cleaning, equipment start-up, TAB,

and task completion for use by the CxA. Update schedule as appropriate throughout the construction period.

16. Attend initial instruction session.
17. Conduct HVAC system orientation and inspection at the equipment placement completion stage.
18. Update drawings to the record condition to date, and review with the CxA.
19. Gather O&M data on all equipment and assemble in binders as required by DDC General Conditions Section 017839, Contract Record Documents and Section 019113, General Commissioning Requirements for MEP Systems.
20. Notify the CxA a minimum of two weeks in advance, so that witnessing equipment and system start-up and testing can begin.
21. Notify the CxA a minimum of two weeks in advance, of the time for start of the TAB work. Attend the initial TAB meeting for review of the TAB procedures.
22. Participate in, and schedule vendors to participate in the instruction sessions.
23. Provide written notification to the CxA that the following work has been completed in accordance with the Contract Documents, and that the equipment, systems, and sub-systems are operating as required.
    a. HVAC equipment including all fans, air handling units, dehumidification units, ductwork, dampers, terminals, and all contracted equipment.
    b. Refrigeration equipment, pumping systems and heat rejection equipment.
    c. Fire stopping in the fire rated construction, including fire and smoke damper installation, caulking, gasketing and sealing of smoke barriers.
    d. Dedicated smoke control systems including stairway pressurization.
    e. Non-dedicated systems using the air handling units for smoke control.
    f. Fire detection and smoke detection devices furnished under other divisions of this specification as they affect the operation of the smoke control systems.
    g. Building control systems that control mechanical equipment and smoke control systems are functioning.
    h. Provide a complete set of as-built records to the CxA.
24. Submit the TAB procedures to the CxA and Commissioner for review and acceptance.
25. Attend the TAB review meeting scheduled by the CxA. Be prepared to discuss the procedures that must be followed in testing, adjusting and balancing the HVAC system.
26. Participate in instruction sessions.
27. At the completion of the TAB work, and submittal of final TAB report, notify the CxA.
28. Participate in verification of the TAB report, which must consist of repeating any selected measurement contained in the TAB report where required by the CxA for verification or diagnostic purposes.
29. Review design for controllability with respect to selected manufacturer's equipment;
    a. Verify proper hardware specifications exist for functional performance required by DDC General Conditions Section 017839, Contract Record Documents and Section 019113, General Commissioning Requirements for MEP Systems Conditions, specifications, and sequence of operation.
    b. Verify proper safeties and interlocks are included in design.
    c. Verify proper sizing of control valves and actuators based on design pressure drops. Verify control valve authority to control coil properly.
    d. Verify proper sizing of control dampers. Verify damper authority to control air stream. Verify proper damper positioning for mixing to prevent stratification. Verify actuator vs. damper sections for smooth operation.
    e. Verify proper selection of sensor ranges.
    f. Clarify all questions of operation.

30. Attend initial commissioning coordination meeting scheduled by the CxA.
31. Provide the following submittals to the CxA;
    a. Hardware and software submittals.
    b. Control panel construction shop drawings.
    c. Narrative description of each control sequence for each piece of equipment controlled.
    d. Diagrams showing all control points, sensor locations, point names, actuators, controllers and, where necessary, points of access, superimposed on diagrams of the physical equipment.
    e. Logic diagrams showing the logic flow of the system.
    f. A list of all control points, including analog inputs, analog outputs, digital inputs, and digital outputs. Include the values of all parameters for each system point. Provide a separate list for each standalone control unit.
    g. A complete control language program listing including all software routines employed in operating the control system. Also provide a program write-up, organized in the same manner as the control software. This narrative must describe the logic flow of the software and the functions of each routine and sub-routine. It should also explain individual math or logic operations that are not clear from reading the software listing.
    h. Hardware operation and maintenance manuals.
    i. Application software and project applications code manuals.
32. Verify proper installation and performance of controls / BAS, hardware, and software provided by other trades.
33. Integrate installation and programming schedule with construction and commissioning schedules.
34. Provide thorough instruction to operating personnel on hardware operations and programming, and the application program for the system.
35. Demonstrate system performance to CxA including all modes of system operation (i.e. normal, abnormal, emergency, etc.).
36. Provide control system technician for use during system verification and functional performance testing.
37. Provide system modifications as required.
38. Provide support and coordination with TAB scopes of work. Provide all devices, such as portable operator's terminals, for TAB use in completing TAB procedures.
39. Additional trend logs may be required to facilitate the commissioning process.

3.9. STARTUP

A. The Contractor must follow the start-up and initial checkout procedures listed in this specification and in DDC General Conditions Section 017839, Contract Record Documents and Section 019113, General Commissioning Requirements for MEP Systems. The Division 23 subcontractor, under the direction of the Contractor has start-up responsibility and is required to complete systems and sub-systems so that they are fully functional and meet the design objectives of the Contract Documents. The commissioning procedures and functional testing do not relieve, lessen this responsibility, or shift that responsibility partially to the CxA or the City of New York.

B. Functional testing is intended to begin upon completion of a system. Functional testing may proceed prior to the completion of systems, or sub-systems at the discretion of the CxA and the Contractor. Beginning system testing before full completion does not relieve the Contractor from fully completing the system, including all Pre-Functional Checklists as soon as possible.

3.10. COMMISSIONING STATUS TRACKING

A. The Contractor must verify that the tag designation as well as the number (count) of each unit listed is correct against those contained within the Contract Documents to ensure that they contain all of the equipment required to be commissioned.

END OF SECTION 23 08 00

SECTION 23 09 00 –INSTRUMENTATION AND CONTROL FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section Includes

1. Automatic temperature controls with building management system.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Submit for approval shop drawings, bill of material, product data sheets, points list, sequence of operations, valve and damper schedules, program flow charts and all product samples required prior to the commencement of any field installation work. Indicate at the beginning of each submittal, all substitutions, and deviations from requirements of Contract Documents. Shop drawing submittals must be complete full-size drawings, 11" x 17" minimum, and include sufficient data to indicate complete compliance with Contract Documents.

B. Provide submittal of screenshots of the proposed graphical user interface front end pages.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Installer must be an entity approved by manufacturer.

C. Materials and equipment must be the catalogued products of manufacturers regularly engaged in production and installation of automatic temperature control systems and must be manufacturer's latest standard design that complies with the specification requirements.

D. Contractor must have single source responsibility for the complete installation and documented verification for proper operation of the control system that must include as a minimum, point to point checkout, sensor calibration, verification of programmed sequences. Supplier must have an in-place support facility within proximity of the site with technical staff, spare parts inventory, all necessary test and diagnostic equipment and a maintained service organization consisting of competent servicemen. On-site emergency service must be available on a 24-hour, 7-day-a-week basis.

1.6 DESCRIPTION OF WORK

A. Provide all labor, materials, equipment and services required to furnish an automatic temperature control system that conforms to the plans and specifications and meets the requirements of the heating, ventilating and air-conditioning systems serving the building.

B. The Contractor must obtain services of an experienced Automatic Temperature Controls subcontractor (ATC) who is regularly engaged in the installation and maintenance of ATC systems. The ATC subcontractor must provide all necessary information and required field supervision for a complete and operable automatic temperature control system.

C. The ATC subcontractor at the direction of the Contractor must be responsible for a complete system of electronic automatic temperature controls. The ATC subcontractor must provide all material, components, devices, thermostats, safety devices, control panels, control dampers, controllers, transformers, actuators, sensing devices, time clocks, relays, control wiring diagrams (line and low voltage), interlocking wiring, smoke detectors, labor, etc. indicated, required or specified.

D. The temperature control system must be electric/electronic and include electronic sensors and electric actuators unless noted otherwise. Include all work required for a complete operational system as defined in the entire set of drawings and specifications, including but not limited to associated specifications for mechanical and electrical work, and all contract drawings.

E. The ATC subcontractor at the direction of the Contractor must furnish all line voltage and low voltage wiring, conduit, panels, and accessories for a complete operational control system. The ATC subcontractor must be responsible for all electrical work associated with the automatic temperature control system, any interface to any other systems including but not limited to HVAC and plumbing systems, and as shown in the contract documents. All line and low voltage must be in accordance with Division 26 requirements. All final electrical connections to each stand-alone controller is the responsibility of the Contractor.

F. The Contractor must furnish all wells for water monitoring devices, flow switches, and alarms to be installed by the ATC subcontractor at the direction of the Contractor.

1.7 USER'S MANUALS

A. Submit two (2) draft copies of user's manual for review. Upon completion of project, acceptance of project by the City of New York, provide three copies of final "as built" manuals and one in digital pdf format. The User’s manual must include the same information that was furnished with the manuals turned over for the base building and must match the format.

1.8 WORK PERFORMANCE SCHEDULE

A. Time-phased schedule for delivery, installation, and acceptance of components for the complete system must be prepared. Submit this schedule to the Commissioner within

five (5) days after award of contract. Submit updates and changes to this schedule promptly to the Commissioner.

1.9 GUARANTEE

A. Provide guarantee the ATC system to be free from defects in workmanship and material for a period of one (1) year from substantial completion. During the guarantee period, the Contractor must furnish all labor to repair and restore or replace all items or components that fail due to defects in workmanship or material.

1.10 INSTRUCTIONS

A. The Contractor must provide factory trained instructors to give full and complete instruction to City of NY staff in the adjustment, operation and maintenance of the system installed rather than a general instruction course. Instructors must be thoroughly familiar with all aspects of the subject matter they are to teach. All instruction must be held during normal work hours of 8:00 a.m. to 4:30 p.m. weekdays. Provide a minimum of six hours of instructions.

1.11 RECORD DRAWINGS

A. This ATC subcontractor at the direction of the Contractor must provide a complete set of "as-built" or record drawings. The drawings must be prepared and delivered to the Commissioner in an acceptable format and must indicate all work installed exactly in accordance with the original design.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Sole Source Product: Honeywell VisionPro 8000 system (No substitutions permitted).

B. General:
   1. The system will cover the following equipment:
      a. Pkgd. Split Dedicated Outdoor Air System DOAS-1 / CU-1
      b. Fans TX-1, SE-1
      c. Electric fan Heaters eh-1,2,3,4,5,6,7
      d. Electric Duct Heaters EDH-1,2,3,4,5
      e. Factory furnished controls devices to include Variable Refrigerant Flow (VRF) unit controls, BACnet Gateway, and all associated control wiring, programming, scheduling and commissioning of system must be installed by the factory trained technician.

C. No additional software and licenses must be required for either internal workstations or remote monitoring sites.

D. Refer to PART-4 for Sequence of Operation.

2.2 AUTOMATIC CONTROLS

A. Furnish and install as herein specified, a complete automatic temperature control system of the

direct digital control electronic type. All temperature controls under this subcontract are to be fully modulating type, except where noted otherwise. The system must be complete in all respects including sensors, dampers, relays, etc. to provide the functions as hereinafter described, regardless of whether or not said sensors, relay etc., are specifically mentioned hereinafter. The system must be installed complete in all respects by competent mechanics.

2.3 OPERATOR / NETWORK INTERFACE

A. The system controller/sever front end must handle all alarming, trending, scheduling, network management, internet access and graphics.

B. The system must be capable of supporting an unlimited number of clients using standard Web browser. Systems requiring additional software (to enable a standard Web browser) to be resident on the client machine, or manufacture-specific browsers are not acceptable.

C. The Web browser software must run on any operating system and system configuration that is supported by the Web browser. Systems that require specific machine requirements in terms of processor speed, memory, etc., in order to allow the Web browser to function with the Building Management System (BMS), are not acceptable.

D. The Web browser client must support at a minimum, the following functions: User log-on identification and password must be required. If unauthorized user attempts access, notice of access failure must be displayed. Security using authentication and encryption techniques to prevent unauthorized access must be implemented. HTML programming must not be required to display system graphics or data on a Web page. HTML editing of the Web page must be allowed if the user desires a specific look or format. Storage of the graphical screens must be in the Network Area Controller (NAC), without requiring any graphics to be stored on the client machine. Systems that require graphics storage on each client are not acceptable. Real-time values displayed on a Web page must update automatically without requiring a manual “refresh” of the Web page. Users must have administrator-defined access privileges. Graphic screens on the Web Browser client must support hypertext links to other locations on the Internet or on Intranet sites, by specifying the Uniform Resource Locator (URL) for the desired link.

E. Alarms: Alarm feature must allow user configuration of criteria to create, route, and manage alarms and events. It must be possible for specific alarms from specific points to be routed to specific alarm recipients. The alarm management portion of the user interface must, at the minimum, provide the following functions: Allow configuration to generate alarms on any numeric, binary, or data point in the system, Generate alarm records that contain a minimum of a timestamp, original state, acknowledged state, alarm class and priority, Allow the establishment of alarm classes that provide the routing of alarms with similar characteristics to common recipients, Allow a user, with the appropriate security level, to manage alarms - including sorting, acknowledging, and tagging alarms and Reports and Summaries.

F. Schedules: A graphical display for time-of-day scheduling and override scheduling of building operations must be provided. At a minimum, the following functions must be provided: Regular schedules, Repeating schedules and Exception Schedules. Weekly schedules must be provided for each group of equipment with a specific time use schedule. It must be possible to define one or more exception schedules for each schedule including references to calendars. Monthly calendars must be provided that allow for simplified scheduling of holidays and special days. Holidays and special days must be user-selected with the pointing device or keyboard.

G. Password: Multiple-level password access protection must be provided to allow the user/manager to user interface control, display, and database manipulation capabilities deemed appropriate for each user, Based on an assigned password. Each user must have the following: a user name, a password, and access levels. The system must provide the capability to require a password of minimum length and require a combination of characters and numerical or special characters. When entering or editing passwords, the system must not echo the actual characters for display on the monitor. The system must provide unlimited flexibility with access rights. A minimum of four levels of access must be provided along with the ability to customize the system to provide additional levels. A minimum of 100 unique passwords must be supported. Operators must be able to perform only those commands available for their respective passwords. Display of menu selections must be limited to only those items defined for the access level of the password used to log-on. The system must automatically generate a report of log-on/log-off and system activity for each user. All log data must be available in .pdf, .txt, and .csv formats.

H. Dynamic Color Graphics: The graphics application program must be supplied as an integral part of the User Interface. The graphics applications must include a create/edit function and a runtime function. The system architecture must support an unlimited number of graphics documents (graphic definition files) to be generated and executed. The graphics must be able to display real-time data that is acquired, derived, or entered.

1. Graphics runtime functions: Each graphic application must be capable of the following functions:
   a. All graphics must be fully scalable.
   b. The graphics must support a maintained aspect ratio,.
   c. Multiple fonts must be supported and Unique background must be assignable on a per graphic basis.
   d. It must be possible to change values (setpoints) and states in systems-controlled equipment within the Web browser interface.
2. A graphic editing tool must be provided that allows for the creation and editing of graphic files. The graphic editor must be capable of performing/defining all runtime binding.

I. Historical Data Collection: All numeric, binary or data points in the system database must allow their values to be logged over time (trend log). Each historical record must include the point's name, a time stamp including time zone, and the point's value. The configuration of the historical data collection must allow for recording data based on change of value or on a user-defined time interval. The configuration of the historical data collection must allow for the collection process to stop or rollover when capacity has been reached. A historical data viewing utility must be provided with access to all history records. This utility must allow historical data to be viewed in a table or chart format. The history data table view must allow the user to hide/show columns and to filter data based on time and date. The history data table must allow exporting to .txt, .csv, or .pdf file formats. The historical data chart view must allow different point histories to be displayed simultaneously, and also provide panning and zooming capabilities.

J. Audit Log: For each log entry, provide the following data; Time and date, User ID, Change or activity: i.e., Change setpoint, add or delete objects, commands, etc.

K. Database Backup and Storage: The user must have the ability to backup the System Controller databases.

2.4 APPLICATION CONTROLLER

A. The controllers must be BACnet MS/TP network devices designed to control HVAC equipment. The controllers must provide many options and advanced system features that allow state-of-the-art commercial building control. Each controller must be programmable and configurable.

B. Each controller contains a host microcontroller to run the main HVAC application and a second microcontroller for BACnet MS/TP network communications. Each controller provides flexible, universal inputs for external sensors, digital inputs, and a combination of analog outputs and digital outputs.

C. Features:

1. Uses BACnet MS/TP network communication.
2. EIA-485 communications network. Capable of baud rates between 9.6 and 115.2 kbits/s.
3. Capable of stand-alone operation, but can also use BACnet MS/TP network communications.
4. Support for up to 40 controllers per BACnet MS/TP segment (under 30 is recommended).
5. Field configurable and programmable for control, input, and output functions using the Niagara framework software.
6. Function Block engine, which allows the application designer to program the controller to perform a wide variety of HVAC applications.
7. Built-in Zone Control functions include a remote wall module interface and a scheduler.
8. Unitary equipment control. Unitary equipment may perform one or all of the functions of HVAC—ventilation, filtration, heating, cooling, humidification and distribution.
9. All wiring connections are made to removable terminal blocks to simplify controller installation and replacement.
10. Both controller housing and actuator are UL plenum rated.

D. Specifications

1. Rated Voltage: 20-30 Vac; 50/60 Hz.
2. Power Consumption: 100 VA for controller and all connected loads.
3. Controller only Load: 5 VA maximum.
4. External Sensors Power Output: 20 Vdc ±10% @ 75 mA maximum.
5. Environmental:
   a. Temperature: Minimum -40° F; Maximum 150° F.
   b. Relative Humidity: 5% to 95% non-condensing.
6. Operating Range: 24 hour, 365 day, multi-year calendar including day of week and configuration for automatic daylight savings time adjustment to occur at 2:00 a.m. local time on configured start and stop dates.
7. Power Failure Backup: 24 hours at 32°F to 100°F (0°C to 38°C), 22 hours at 100°F to 122°F (38°C to 50°C).
8. Accuracy: ±1 minute per month at 77° F (25° C).

2.5 CABLING

A. Cabling should be selected that meets or exceeds the BACnet Standard which specifies the following: an MS/TP EIA-485 network must use shielded, twisted-pair cable with characteristic impedance between 100 and 130 ohms. Distributed capacitance between conductors must be less than 100 pF per meter. Distributed capacitance between conductors and shield must be less that 200 pF per meter (60 pF per foot). Foil or braided shields are acceptable.

B. Building Controllers: The BACnet MS/TP network is polarity sensitive. The maximum BACnet MS/TP network Bus segment length is 4,000 ft. using recommended wire. Repeaters must be used when making runs longer than 4,000 ft. A maximum of three repeaters can be used between any two devices.

2.6 FIELD DEVICES

A. General

1. All field devices and equipment must be submitted for approval by Commissioner.

B. Analog Sensors

1. All temperature sensors must use thermistors with sensor accuracy of +/- .5 ºF. The space sensor must have a local display for space temperature and set point and a provision for adjusting the space set point.
2. Humidity sensors must be capacitive type with an accuracy of 2%.
3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Setra.
   b. IFM Efector,
   c. M & M control.
   d. Hycal.
   e. Minco.
   f. Thermik.
   g. Locon Sensir systems, Inc.
   h. Kinequip, Inc.
   i. Or approved equal.

C. Wall Sensor:

1. Wall sensor must include temperature, humidity and CO2 sensor with MS/TP capability provide users with control interface, test and balance tool and filed service tool.
2. The strengthened glass touchscreen user interface must have capability to display the setpoint, room, and outside air temperature, relative humidity and CO2 level.
3. The thermistors are integrated with the device. The thermistors and humidity sensors must be processed by an onboard microcontroller.
   a. Thermistors:
      1) Type: NTC.

2) Resistance - 100K Ohm at 77 °F (25 °C).
3) Time Constant* - 20 minutes (to 63% of new temperature).
4) Stability* - Maximum 0.036 °F (0.02 °C) drift per year.
5) Accuracy* - ± 0.36 °F over range of 32 to 116 °F (0 to 47 °C); ± 0.19 °F at 72 °F (22 °C).
6) Power - 24 VAC.

b. CO2 Sensor:
1) Operating Temperature Range - 32 to 122 °F (0 to 50 °C).
2) Power Consumption - 1.5 mA for measurement every 30s; 0.74 mA for measurement every 60s; 86 µA for measurement every 15 min; 52 µA for measurement every 60 min.
3) Measurement Range - 0 to 5000 ppm.
4) Accuracy - ± 30 ppm, ± 3% of reading.

c. Humidity Sensor:
1) Operating Temperature Range - 50 to 113 °F (10 to 45 °C).
2) Repeatability - Minimum ± 0.5% RH.
3) Accuracy - ± 3% at 10 to 90% RH, ± 5% at 0 to 10% and 90% to 100%RH.
4) Communications - Microset bus up to 115.2 Kbps.
5) Ratings - UL Standard for Safety 916; EMC Directive 89/336/EEC (European CE Mark)FCC Part 15.107 & 109, Class B, CFR47-15.

D. Leak Detection Sensor:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Liebert.
b. Kele.
c. BAPI.
d. Or approved equal.

2. Description: Leak detector alarm module must indicate that water has contacted the sensors by actuating two output relays. The relays must remain activated until the module is reset.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL

A. Installation Criteria

1. Space mounted devices are to be identical in appearance. All devices must be mounted under the same style cover.

2. Room sensors and thermostats must not be located on outside walls.

3. Provide all relays, switches, sources of electricity and all other auxiliaries, accessories and connections necessary to make a complete operable system in accordance with the sequences specified.
4. Install controls so that adjustments and calibrations can be readily made. Controls are to be installed by the control equipment manufacturer.
5. Mount surface-mounted control devices, tubing and raceways on brackets to clear the final finished surface on insulation.
6. Conceal control conduit and wiring in all spaces except in the Mechanical Equipment Rooms and in unfinished spaces. Install in parallel banks with all changes in directions made at 90 degree angles.
7. Unless otherwise noted, install wall-mounted sensors, thermostats and humidistats to meet ADA requirements. Submit device samples, locations, mounting heights and details for approval for all devices.
8. All relays, electrical wiring, panels, outputs, etc. to make a complete operational system, must be provided and installed by this section. See sequences of operation for details.

B. Design Criteria

1. The Automatic Temperature Control (ATC) must be programmed to start and stop the Rooftop Unit based on occupancy schedules as coordinated with the Commissioner. The ATC must also provide equipment interlocks as required.
2. Fire Alarm Interface for Fans
   a. The Fire Alarm System must provide outputs to notify the ATC of fire alarms.
   b. All fan systems must be stopped from the FAS. When the fan system stops, all associated dampers must close.
   c. All return and exhaust fans must be stopped from the FAS. When the fan stops, all associated dampers must close.
   d. Smoke purge fan EF-1 must be energized upon manual activation from the fire fighters control panel.

3.3 ELECTRICAL INSTALLATION WIRING AND MATERIALS

A. The ATC subcontractor at the direction of the Contractor is responsible for all electrical control work associated with the ATC, HVAC and plumbing systems, which is not specified as work of other trades.

1. Perform all wiring in accordance with 2014 NYC Electrical Code including the NEC.
2. Install all line voltage wiring, concealed or exposed, in conduit in accordance with the Division 26 specifications, NEC and NYC building code. Utilize #14 A.W.G. THWN conductor minimum throughout for power wiring (120 VAC or greater) except in conjunction with a manual starter.
3. All low voltage electrical control wiring may be run in plenum rated cable above accessible hung ceilings. Plenum cable must be run parallel to building lines and supported from the building structure (not from duct, pipe or associated hangers) with bridle rings.

4. Provide extension of 120 volt, 20 amp circuits and circuit breakers from emergency power panels for entire system, as required.
5. Provide all miscellaneous field device mounting and interconnecting control wiring for all mechanical systems.
6. All control and power wiring associated with the control of all automatic, fire/smoke or smoke dampers must be installed in conduit, regardless of voltage. All control and power wiring for relays associated with the control of any automatic, fire/smoke or smoke damper must be installed in conduit, regardless of voltage.
7. Provide electrical wall box and conduit sleeve for all wall mounted devices.
8. Fire stopping must be provided for all penetrations of conduit, etc. through fire rated walls and floors and other fire rated separations.
9. Where conduit is required, it must be steel electric metallic tubing (EMT), except that it must be galvanized intermediate steel conduit where located within 8'-0" of the floor in mechanical spaces (or is otherwise exposed to mechanical damage), or is intended for embodiment in concrete.
10. Wires and cables must have characteristics - in compliance with Articles 725 and/or 800 as applicable, of the National Electrical Code - as described elsewhere in the specifications or drawings for this project, and must be UL listed in accordance therewith.

3.4 TESTING AND ACCEPTANCE

A. Acceptance Testing

1. Submit for approval, a detailed acceptance test procedure designed to demonstrate compliance with contractual requirements.
2. Demonstrate system performance to Commissioner for final system acceptance.

PART 4 - SEQUENCES OF OPERATION

4.1 GENERAL

A. Provide a complete and operational temperature control and building automation system based on the following points and sequence of operation. The system must be complete as to sequences and standard control practices. The determined point list is the minimum amount of points that are to be provided. If additional points are required to meet the sequence of operation, they will be provided.

B. BACnet Object List

1. The following points as defined for each piece of equipment are designated as follows:

   a. Binary Out (BO) - Defined as any two-state output (start/stop) (enable/disable), etc.
   b. Binary In (BI) - Defined as any two-state input (alarm, status), etc.
   c. Analog In (AI) - Defined as any variable input (temperature) (position), etc.
   d. Analog Out (AO) - Defined as any electrical variable output. 0–20mA, 4–20mA and 0–10VDC are the only acceptable analog outputs. The driver for analog outputs

must come from both hardware and software resident in the controllers. Transducers will not be acceptable under any circumstance

C. All set points referenced in this section are subject to change and must be adjustable from the BMS Operator Workstation and from a Portable Operators Terminal.

4.2 DEDICATED OUTDOOR AIR SYSTEM (DOAS-1 / CU-1)

A. General

1. The DOAS-1 is provided with factory installed controls. The safety controls, operating modes and sequence of operation are summarized below for commissioning reference.

B. Safety Controls

1. Provide low-limit controller to prevent mixed air from falling below 45°F.
2. A hard-wired interlocked supply high discharge switch must stop the supply fan when duct pressure exceeds design value. The fan must remain off until the pressure switches are reset. An alarm condition will be sent to the BMS.
3. All duct mounted automatic control instruments must be mounted on the exterior surface of the insulation, on suitable metal saddles. Provide appropriate extension mountings for control devices to clear insulation.

C. Operating Modes:

1. The operating modes of the DOAS-1 must be automatically determined by the combined input of the building schedule, controls and safety devices.
2. Mode Selection:
   a. Heating mode for outdoor temperature below 55 deg F - supply air temperature set to 70 deg F.
   b. Economizer cooling from 55 deg F to 70 deg F – supply air enthalpy not exceeding 23.5 Btu/lb.
   c. Activate dehumidification cycle and hot gas reheat for outside air enthalpy exceeding 23.5 Btu/lb to maintain supply air dewpoint of 55 deg F, supply air temperature of 65 deg F.
   d. Cooling for outdoor air temperature exceeding 70 deg F, coil discharge air temperature of 55 deg F.

D. Sequence of Operation:

1. Unoccupied Cycle: When the DOAS-1 is in unoccupied mode, the outside air damper must be closed, the fans must be OFF.
2. Occupied Cycles:
   a. The supply fan is commanded ON to run continuously subject to all safeties.
   b. The outside air dampers must fully open.
   c. The unit will start and operate in cooling or heating mode based on outside air temperature to reach a design discharge air set-point.

d. Occupied Heating

1) The unit to be scheduled in occupied heating mode based on outside temperature and schedule. If the outside temperature is below 55°F (adj.) and space is in occupied mode the unit will be in heating occupied mode.
2) The unit will be tempering the outdoor air by modulating SCR controlled electric heating coil to maintain duct discharge temperature of 70 deg F.
3) When the discharge air temperature rise above 72°F (adj.) the heating coil must modulate down. If the temperature in space will keep rising above 74°F (adj.) the heat will turn off.
4) If the supply air temperature fall below 68°F (adj.) the heating coil will be energized.
5) Supply fan to always circulate air when the unit is in occupied heating mode.
6) Upon loss of communication with the BMS network, the direct digital controller must revert to a default schedule internal to the controller, automatically resuming normal schedule operation once communication is resumed.

e. Economizer Mode:

1) The unit to be scheduled in economizer mode based on outside temperature and schedule. If the outside temperature is between 55°F (adj.) and 70 deg F, outside air enthalpy not exceeding 23.5 Btu/lb and space is in occupied mode the unit will be in economizer mode.

f. Dehumidification and Reheat Mode:

1) The unit to be scheduled in dehumidification and (hot gas) reheat mode based on outside temperature and schedule. If the outside temperature is between 55°F (adj.) and 70 deg F, outside air enthalpy exceeds 23.5 Btu/lb and space is in occupied mode the unit will be in dehumidification and reheat mode and to maintain discharge cooling setpoint of 55°F (adj.) with 2-F (adj.) differential.

g. Occupied Cooling

1) The unit to be scheduled in occupied cooling mode based on outside temperature and schedule.
2) If the outside temperature is greater than or equal to 70F, the unit must be indexed to the Mechanical Cooling Mode. Mechanical DX cooling must be controlled in stages and sequenced to maintain discharge cooling setpoint of 55°F (adj.) with 2-F (adj.) differential.
3) Supply fan to circulate always when the unit is in occupied cooling mode.
4) Upon loss of communication with the BMS network, the direct digital controller must revert to a default schedule internal to the controller, automatically resuming normal schedule operation once communication is resumed.

h. Demand Control Ventilation

1) Room level CO2 sensor must modulate associated room outdoor air supply motorized damper to maintain CO2 setpoint of 800 ppm (adjustable).
2) Field installed duct mounted static pressure must modulate supply fan in response to changes in supply duct static via 0-10V signal to supply fan variable frequency drive from BMS.

E. BMS Points

1. Provide for following BMS I/O points.
   a. Inputs:
      1) Fire alarm system status.
      2) Supply air fan status.
      3) Number of cooling stages.
      4) Discharge air temperature.
      5) Outside air temperature.
      6) Outside air humidity.
      7) Supply air humidity.
      8) Filter status.
      9) Compressor status.
      10) Low suction pressure alarm.
      11) High static pressure alarm.
      12) Fan failure alarm.
      13) Outdoor Air Flow CFM.
      14) Differential Pressure.
      15) Outside air damper failure alarm.
      16) Outside air damper position.
      17) Exhaust air damper.
      18) Compressor lock out temperature.
      19) Heating lock out temperature.

   b. Outputs:
      1) Occupied cooling setpoint temperature.
      2) Occupied humidity setpoint.
      3) Occupied heating setpoint temperature.
      4) Economizer control setpoint
      5) Time of day schedule.
      6) Outside air damper position.
      7) Compressor lock out temperature.
      8) Heating lock out temp.

4.3 DEMAND CONTROL VENTILATION

A. The following spaces must be provided CO_2 sensor and modulating control damper for demand control ventilation.
   1. Multipurpose Room.
   2. Children’s Stacks.
   3. Children’s Reading Room.
   4. Adult Reading Room
   5. Teen Reading Room.

6. YALP Classroom.

B. The motorized control damper must modulate to maintain conditioned outside air supply to the above listed spaces to maintain space CO2 setpoint of 800 ppm (adjustable)

C. BMS Point

1. Space CO_2 setpoint.
2. Space CO_2 level.
3. CO_2 control damper position.

4.4 VRV HEAT RECOVERY SYSTEM

A. Refer to Section 238129 “Variable Refrigerant Flow HVAC Systems” for the factory furnished control and associated sequences. The ATC subcontractor must provide all required field wiring of controls that cannot be factory installed for proper AC unit operation. The ATC subcontractor must connect the direct digital controller to the NAC network for point monitoring and control from the central BMS system. All available points at unit controller must be monitored by the BMS.

B. The unit must run according to a user definable schedule. The fan must have a user definable minimum runtime.

C. Direct Digital Control Points (Each Unit)

1. Start/Stop Status.
2. Start/Stop Operation.
3. Cooling/Heating Mode Setting.
4. Room Temperature Setpoint.
5. Airflow Rate Setting.
6. Airflow Direction Setting.
7. Alarm.
8. Malfunction Code.
9. Air-Conditioning Mode.
10. Room Temperature.
11. Filter Status.
12. Compressor Status.
13. Indoor Fan Status.

4.5 EXHUAST FAN – ON/OFF (TX-1)

A. The fan must run according to a user definable schedule. The fan must have a user definable minimum runtime. All scheduling and control must be through the BMS interface.

B. The exhaust air motorized damper must open anytime the unit runs and must close anytime the unit stops. The fan must be enabled after the damper status has proven.

C. The BMS must monitor the fan status.

D. Direct Digital Control Points:
1. Fan Start/Stop.
2. Fan Status.
3. Damper Status.
4. Schedule.
5. Fan Failure.
6. Damper Failure.
7. Low suction alarm.

4.6 SMOKE PURGE FAN

A. Smoke purge fan is to be manually energized/ deenergized by FDNY via the smoke purge key switch in fire alarm panel.

B. The motorized damper must be hardwired interlocked with the fan. The damper must open anytime the fan is energized and must close anytime the fan stops. The fan must be enabled after the damper status has been proven.

C. Status at fire alarm panel:
1. Fan Status.
2. Damper Status.
3. Fan Failure.
4. Damper Failure.

4.7 ELECTRIC HEATER (EH)

A. The thermostat must measure the zone temperature and cycle on/off the heat to maintain its setpoint.

B. The BMS must control the heater operation and monitor the heater status.

C. Direct Digital Control Points:
1. Zone temperature set point.
2. Zone temperature.
3. High/low zone temperature.
4. High/low discharge air temperature.
5. Heater status.
6. Heater failure.

4.8 IT CLOSET

A. Room sensor must cycle AC unit to maintain setpoint.

B. Provide room temperature sensor.

C. Direct Digital Control Points:
1. Room high temperature alarm.

4.9 AUXILIARY PAN LEAK

A. Provide leak detector in auxiliary drain pan where indicated on plans.

B. Provide leak detection in elevator sump pump.

C. Direct Digital Control Points:
   1. Leak alarm.

4.10 MISCELLANEOUS ALARMS

A. Provide level sensor in the sump pit.
   1. Sump pump shall run when level of liquid rises above set level in the sump pit.

B. Provide high water level sensor in sump pit.
   1. Direct Digital Control Points: High water level alarm.

END OF SECTION 23 09 00

SECTION 23 23 00 – REFRIGERANT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. This Section includes refrigerant piping and AC condensate piping used for air-conditioning applications.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each type of valve and refrigerant piping specialty indicated. Include pressure drop based on manufacturer's test data.

B. Shop Drawings: Show layout of refrigerant piping and specialties, including pipe, tube, and fitting sizes, flow capacities, valve arrangements and locations, slopes of horizontal runs, oil traps, double risers, wall and floor penetrations, and equipment connection details. Show interface and spatial relationships between piping and equipment.

C. Technician Certification: Submit qualification for refrigerant technician in accordance with requirements of Title 40 CFR. Part 82, Subpart F, Article 82.161. The technician must have current Universal certification for servicing all types of equipment.

D. Equipment Certification: Submit certification for refrigerant recovery equipment in accordance with requirements of Title 40 CFR. Part 82, Subpart F, Article 82.162.

E. Field quality-control test reports.

F. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Materials must conform to the latest edition of reference specifications and industry standards.

C. Certify brazing procedures, brazers, and operators in accordance with ASME Boiler and Pressure Vessel Code, Section IX, for shop and jobsite brazing of piping work.

D. Manufacturer's Qualifications: Firms regularly engaged in manufacture of pipes and pipe fittings of types and sizes required, whose products have been in satisfactory use in similar service for not less than 3 years.

E. Comply with ASHRAE 15, "Safety Code for Refrigeration Systems."

F. All work must be performed in compliance with provisions of section 608 of 1990 US Clean Air Act and Title CFR 40, Part 82,Subpart F. and in accordance with New York City Fire Code.

1.6 WARRANTY

A. Manufacturer must provide warranty for a period of one year from substantial completion. Warranty must cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer’s written instructions for installation, operation and maintenance have been followed.

1.7 PRODUCT STORAGE AND HANDLING

A. Provide factory-applied plastic end caps on each length of pipe and tube. Maintain end caps through shipping, storage and handling as required to prevent pipe-end damage and eliminate dirt and moisture from inside of pipe and tube.

B. Store piping in a clean and protected area with end caps in place to ensure that piping interior and exterior are clean when installed.

PART 2 - PRODUCTS

2.1 COPPER TUBE AND FITTINGS

A. Copper Tube: ASTM B 280, Type ACR.

B. Wrought-Copper Fittings: ASME B16.22.

C. Wrought-Copper Unions: ASME B16.22.

D. Solder Filler Metals: ASTM B 32. Use 95-5 tin antimony or alloy HB solder to join copper socket fittings on copper pipe.

E. Brazing Filler Metals: AWS A5.8.

F. Flexible Connectors:

1. Body: Tin-bronze bellows with woven, flexible, tinned-bronze-wire-reinforced protective jacket.
2. End Connections: Socket ends.
3. Offset Performance: Capable of minimum 3/4-inch misalignment in minimum 7-inch- long assembly.
4. Pressure Rating: Factory test at minimum 500 psig
5. Maximum Operating Temperature: 250 deg F

2.2 REFRIGERANTS

A. Manufacturers: Subject to compliance with requirements, provide products by one the following:
1. DuPont.
2. Honeywell.
3. Mexichem.
4. Or approved equal.

B. Refrigerant: R-410 A

2.3 INSULATION

A. Manufacturers: Subject to compliance with requirements, provide products by one the following:
1. AP Armaflex.
2. Firwin Corp.
3. AC Accoflex.
4. Or approved equal

B. The insulation must conform to ASTM C534 Grade 1, Type I.

C. Insulation materials must have a closed cell structure to prevent moisture from wicking which makes it an efficient insulation.

D. Insulation materials must be manufactured without the use of CFC's, HFC's or HCFC's. It is also formaldehyde free, low VOCs, fiber free, dust free and resists mold and mildew.

E. Insulation materials must have a flame-spread index of less than 25 and a smoke-developed index of less than 50 as tested in accordance with ASTM E 84. In addition, the products, when tested, must not melt or drip flaming particles, and the flame must not be progressive.

F. Insulation materials must have a maximum thermal conductivity of 0.27 Btu-in./h-ft2-°F at a 75°F mean temperature as tested in accordance with ASTM C 177 or ASTM C 518.

G. Insulation materials must have a maximum water vapor transmission of 0.08 perm-inches when tested in accordance with ASTM E 96, Procedure A.

H. All low temperature lines (+10°F and below) must be insulated with a minimum insulation thickness minimum in compliance with NYCECC 2020. Refer to Dwg. M-001 for insulation thickness.

I. All insulation exposed to sunlight or installed outdoors must be protected with two coats of weather resistant coating for UV protection.

2.4 LINE SET COVER

A. Sole Source Manufacturer: Inaba-Denko America.
   1. Model: Slimduct RD and Slimduct RDW.
   2. No substitutions permitted.

B. The line-set cover must comprise of 20-gauge, roll-formed rectangular sheet metal line-set duct and fittings. It must feature anti-corrosive, scratch-resistant hot-dipped and chromium-free ZAM coating (Zinc, Aluminum and Magnesium) that provides a superior, more durable and lighter weight alternative to galvanized steel.

C. Available widths of 12-, 18-, 24- and 36-in. respectively must all be 5-1/8-in. high. Based on a 3/8 x 3/4-in. line-set with 1/2-in. insulation on both lines, the line-set ducting must accommodate the following number of line-sets:
   1. 12 inch width (8),
   2. 18 inch width (12)
   3. 24 inch width (19)
   4. 36 inch width (25)

D. On rooftop systems when the top of the line-set duct is used as walkways, a reinforced heavier gauge cover plate with a non-skid surface must be available as a special-order option.

E. The line-set system can be used vertically or horizontally to protect line-sets associated with any air conditioning, refrigeration or industrial cooling process equipment.

2.5 ROOF PENETRATION HOUSING

A. Manufacturers: Subject to compliance with requirements, provide products by one the following:
   1. Roof Penetration Housings, LLC.
   2. Alta Products, LLC.
   3. SBC Industries.
   4. Or approved equal.

B. Four-piece powder coated heavy gauge aluminum assembly (vandal resistant lid, pre-insulated housing (R4.3 @ 75F), insulation extension and curb), stainless steel screws.

C. Designed to meet the IECC 2015/2018 code for roof insulation integrity.

D. Compliance

1. Third party tested for compliance to FEMA 320/361 & ICC 500-2014 for 225mph hurricane winds.
2. Third party tested to meet 2015 IECC C402.5 & ASTM E2178-13 for air permeance/air leakage.
3. Manufactured in USA ISO 9001 facility.
4. Solar Reflection Index of 88.2.

E. Exit Seals: Weather-tight Exit Seals & ductwork adapters.
1. Threaded connection or flange connection easily & quickly attaches to vault.
2. Weather tight and UV resistant.
3. Gaskets rated for -25°F to +475°F.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PIPING APPLICATIONS

A. Hot-Gas and Liquid Lines**,** and Suction Lines for Heat-Pump Applications: Copper, Type ACR, annealed-temper tubing and wrought-copper fittings with brazed joints.

B. Ac Condensate: Copper Type K or L, ASTM B88.

3.3 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems; indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Shop Drawings.

B. Install refrigerant piping according to ASHRAE 15.

C. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping adjacent to machines to allow service and maintenance.

G. Install piping free of sags and bends.

H. Install fittings for changes in direction and branch connections.

I. Select system components with pressure rating equal to or greater than system operating pressure.

J. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.

K. Arrange piping to allow inspection and service of refrigeration equipment. Install valves and specialties in accessible locations to allow for service and inspection. Install access doors or panels as specified in Section 08 31 13 "Access Doors and Frames" if valves or equipment requiring maintenance is concealed behind finished surfaces.

L. Install refrigerant piping in protective PVC conduit where installed belowground.

M. Install refrigerant piping in rigid or flexible conduit in locations where exposed to mechanical injury.

N. When brazing or soldering, remove solenoid-valve coils and sight glasses; also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion-valve bulb.

O. Install pipe sleeves at penetrations in exterior walls and floor assemblies.

P. Seal penetrations through fire and smoke barriers according to Section 07 84 13 "Penetration Firestopping."

Q. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.

R. Install sleeves through floors, walls, or ceilings, sized to permit installation of full-thickness insulation.

S. Seal pipe penetrations through exterior walls according to Section 079200 "Joint Sealers" for materials and methods.

3.4 PIPE JOINT CONSTRUCTION

A. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," Chapter "Pipe and Tube."

1. Use Type BcuP, copper-phosphorus alloy for joining copper socket fittings with copper pipe.

3.5 PIPING INSULATION INSTALLATION

A. Refrigerant Piping Installation

1. All refrigerant copper lines must be free of extraneous chemicals such as corrosive cleaners or building materials' dust prior to the installation of the insulation. The insulation must be clean and dry prior to installation.

2. Refrigerant pipe must be sealed while slipping on insulation to prevent foreign matter from entering the tube.

3. Insulation is to be slid onto pipe; longitudinal slitting of the insulation is not allowed except on mitered sections. Insulation must be pushed onto pipe, not pulled.

4. Insulation must be mitered, pre-adhered and longitudinally slit inside throat to fit over all P-traps, tees and elbows or bends over 90°.

5. All butt joints and mitered seams must be adhered with full coverage of adhesive on both surfaces. Insulation must not be stretched when adhering.

6. Insulation must be installed in an adequately ventilated area. It may be necessary to increase insulation thickness if adequate ventilation is not present, Do not crowd the insulation, allow for adequate air movement.

7. At the beginning, at every 12 to 18 feet, and at the ends of piping runs, the insulation must be adhered directly to the copper using a 2" strip of adhesive. Insulation should not be adhered to the pipe at the extreme low points in any piping run.

8. Saddles must be installed under all insulated lines at unistrut clamps, clevis hangers, or locations where insulation may be compressed.
   a. Insulation pipe hangers can be installed at the compression locations and the seams must be sealed with contact adhesive.
   b. To minimize the movement of insulation hangers it is recommended that a pair of non-skid pads be adhered to the clamps. In addition, to prevent loosening of the clamps, use of an anti-vibratory fastener, such as a nylon-locking nut, is also recommended.
   c. Wood dowels or blocks, of a thickness equal to the insulation, can be inserted and must be completely sealed into the insulation at the saddle locations. All seams must be sealed with contact adhesive or approved equal.
   d. Hangers clamped directly to the pipe must be insulated over the hanger; insulation must be fully adhered to the hanger. In addition, hangers with double rods must be insulated between the rods. All seams of the insulation must be sealed with adhesive.
   e. All insulation exposed to sunlight or installed outdoors must be protected with two coats of weather resistant coating.

3.6 HANGERS AND SUPPORTS

A. Hanger, support, and anchor products are specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."

B. Install the following pipe attachments:

1. Copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.

C. Install hangers for copper tubing with the following maximum spacing and minimum rod sizes:
1. NPS 5/8: Maximum span, 60 inches; minimum rod size, 1/4 inch .
2. NPS 1: Maximum span, 72 inches minimum rod size, 1/4 inch.

3.7 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

B. Tests and Inspections:

1. Comply with ASME B31.5, Chapter VI.
2. Test refrigerant piping and specialties. Isolate compressor, condenser, evaporator, and safety devices from test pressure if they are not rated above the test pressure.
3. Test high- and low-pressure side piping of each system separately at not less than the pressures indicated in Part 1 "Performance Requirements" Article.

a. Fill system with nitrogen to the required test pressure.
b. System must maintain test pressure at the manifold gage throughout duration of test. Refrigerant system piping must be tested in three steps
1) Step 1: leak check after 3 min @ 150 psig
2) Step 2: leak check after 5 min @ 300 psig
3) Step 3: leak check after 24 hr @ 550 psig
c. Test joints and fittings with electronic leak detector or by brushing a small amount of soap and glycerin solution over joints.
d. Remake leaking joints using new materials and retest until satisfactory results are achieved.

3.8 SYSTEM CHARGING

A. Charge system using the following procedures:

1. Install core in filter dryers after leak test but before evacuation.
2. Evacuate system as follow:
a) Evacuate system to 4000 microns and hold for 20 minutes. break vacuum with 2-3 psi dry nitrogen and hold for 15 minutes.
b) Evacuate system to 1500 microns and hold for 20 minutes. break vacuum with 2-3 psi dry nitrogen and hold for 15 minutes.
c) Evacuate system to 500 microns and hold for 60 minutes.
3. Refrigerant system with a vacuum pump to 500 microns Hg. If vacuum holds for 12 hours at ambient temperatures of 60ºF, system is ready for charging.
4. Break vacuum with refrigerant gas, allowing pressure to build up to 2 psig.
5. Charge system with a new filter-dryer core in charging line.

3.9 REFRIGERANT HANDLING

A. Contractor must follow provisions outlined in section 608 of the 1990 US Clean Air Act and Title 40 CFR, Part 82, Subpart F for safe handling and disposal of Class I and Class II refrigerants to include:

1. Refrigerant technician certification

2. Refrigerant recovery equipment certification

3. Appliance or equipment evacuation vacuum levels

4. Hazardous materials manifest reporting and record keeping.

5. Safe disposal of refrigerants

B. In event of accidental release of refrigerant the contractor must follow the procedures for reporting release of hazardous materials in accordance with NYC Fire Code, section 606.13.

3.10 ADJUSTING

A. Perform the following adjustments before operating the refrigeration system, according to manufacturer's written instructions:
1. Verify that compressor oil level is correct.
2. Open compressor suction and discharge valves.
3. Open refrigerant valves except bypass valves that are used for other purposes.

3.11 REPORTING

A. Contractor must prepare a Certificate of Test in accordance with New York City Mechanical Code, Section 1108.4

END OF SECTION 23 23 00

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 23 31 13 - METAL DUCTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section Includes:

1. Rectangular ducts and fittings.
2. Round ducts and fittings.
3. Sheet metal materials.
4. Duct liner.
5. Sealants and gaskets.
6. Hangers and supports.

1.3 RELATED SECTIONS:

A. Section 23 05 93 – “Testing, Adjusting, and Balancing for HVAC” for testing, adjusting, and balancing requirements for metal ducts.

B. Section 23 33 00 – “Air Duct Accessories” for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Submittals:

1. Documentation indicating that duct systems comply with ASHRAE 62.1-2013, Section 5 - "Systems and Equipment."
2. Documentation indicating that duct systems comply with ASHRAE/IESNA 90.1-2013, Section 6.4.4 - "HVAC System Construction and Insulation."
3. For adhesives and sealants, including printed statement of VOC content.

C. Shop Drawings:

1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
2. Factory- and shop-fabricated ducts and fittings.
3. Duct layout indicating sizes, configuration, liner material, and static-pressure classes.
4. Elevation of top of ducts.
5. Dimensions of main duct runs from building grid lines.
6. Fittings.
7. Reinforcement and spacing.
8. Seam and joint construction.
9. Penetrations through fire-rated and other partitions.
10. Equipment installation based on equipment being used on Project.
11. Locations for duct accessories, including dampers, turning vanes, and access doors and panels.
12. Hangers and supports, including methods for duct and building attachment and vibration isolation.

D. Engineering Services Submittal:

1. Sheet metal thicknesses.
2. Joint and seam construction and sealing.
3. Reinforcement details and spacing.
4. Materials, fabrication, assembly, and spacing of hangers and supports.

E. Coordination Drawings: Plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Duct installation in congested spaces, indicating coordination with general construction, building components, and other building services. Indicate proposed changes to duct layout.
2. Suspended ceiling components.
3. Structural members to which duct will be attached.
4. Size and location of initial access modules for acoustical tile.
5. Penetrations of smoke barriers and fire-rated construction.
6. Items penetrating finished ceiling including the following:

    a. Lighting fixtures.
    b. Air outlets and inlets.

c. Speakers.
d. Access panels.
e. Perimeter moldings.

F. Welding certificates.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2007, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-Up"

C. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2013, Section 6.4.4 - "HVAC System Construction and Insulation"

1.7 PERFORMANCE REQUIREMENTS

A. Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, must comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.

B. Structural Performance: Duct hangers and supports must withstand the effects of gravity loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible".

C. Airstream Surfaces: Surfaces in contact with the airstream must comply with requirements in ASHRAE 62.1-2013.

1.8 WARRANTY

A. Manufacturer must provide warranty for a period of one year from substantial completion. Warranty must cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer’s written instructions for installation, operation and maintenance have been followed.

PART 2 - PRODUCTS

2.1 RECTANGULAR DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-4, "Transverse (Girth) Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support

intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-5, "Longitudinal Seams - Rectangular Ducts," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 2, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.2 ROUND DUCTS AND FITTINGS

A. All round and /or flat oval ducts must be factory fabricated spiral duct and fittings. All spiral duct and fittings must be manufactured by same company who has been in business for at least 3 years. Duct construction must comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Lindab Inc.
b. McGill AirFlow LLC.
c. SEMCO Incorporated.
d. Spiral Manufacturing Co., Inc.
e. Or approved equal

B. Branch connections must be made with 90° conical and 45° straight taps as shown on the drawings. All branch connections must be made as a separate fitting. Factory or field installation of taps into spiral duct are not allowed without written approval of the Commissioner.

C. All elbows must be fabricated with a centerline radius of 1.5 times the diameter. 90° and 45° elbows in diameters 3" round through 12" round must be stamped or pleated elbows. All other elbows must be of the gored type, fabricated in accordance with the following: 2 gores less than 36º, 3 gores for 37º thru 71ºF and 5 gores for 72º thru 90º.

D. Circumferential and longitudinal seams of all fittings must be a continuous weld or spot welded and sealed with mastic. All welds must be painted to prevent corrosion.

E. All field joints for round ducts up to and including 36" diameter and oval ducts up to and including 41" major axis must be made with a 2" slip-fit or slip coupling. Access doors must be supplied by the duct manufacturer at all fire and/or smoke dampers. All flanges and

access doors must be factory installed. Shipments of loose flanges, access doors, or taps for field installation into spiral duct will not be allowed.

F. All flat oval duct must be reinforced with trapeze type reinforcement, as recommended by the manufacturer, to limit wall deflection to 3/4" and reinforcement deflection to 1/4".

G. Metal gauges for single wall round and flat oval duct must be as follows:

1. Spiral Duct for positive pressure & negative pressure

Diameter	Galvanized Sheet Steel Metal Gauges			
	+ 4 in wg	+10” wg	- 4 in wg	-10” wg
3” thru 16”	26	26	24	22

2. Solid spiral seam inner must be 24 for duct sizes up to 20 inches and 20 gauge for larger ducts.

2.3 SHEET METAL MATERIALS

A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials must be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G90
2. Finishes for Surfaces Exposed to View: Mill phosphatized.

C. Carbon-Steel Sheets: Comply with ASTM A 1008/A 1008M, with oiled, matte finish for exposed ducts.

D. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304 or 316, as indicated in the "Duct Schedule" Article; cold rolled, annealed, sheet. Exposed surface finish must be No. 2B, No. 2D, No. 3, or No. 4 as indicated in the "Duct Schedule" Article.

E. Aluminum Sheets: Comply with ASTM B 209 (ASTM B 209M) Alloy 3003, H14 temper; with mill finish for concealed ducts, and standard, one-side bright finish for duct surfaces exposed to view.

F. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.

G. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches

2.4 DUCT LINER

A. Liner must be limited to ductwork indicated on plans.

B. Fibrous-Glass Duct Liner: Comply with ASTM C 1071, NFPA 90A, or NFPA 90B; and with NAIMA AH124, "Fibrous Glass Duct Liner Standard."

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. CertainTeed Corporation; Insulation Group.
b. Johns Manville.
c. Knauf Insulation.
d. Owens Corning.
e. Or approved equal.

2. Maximum Thermal Conductivity:

a. Type I, Flexible: 0.27 Btu x in./h x sq. ft. x deg F at 75 deg F (24 deg C) mean temperature.
b. Type II, Rigid: 0.23 Btu x in./h x sq. ft. x deg F at 75 deg F (24 deg C) mean temperature.

3. Antimicrobial Erosion-Resistant Coating: Apply to the surface of the liner that will form the interior surface of the duct to act as a moisture repellent and erosion-resistant coating. Antimicrobial compound must be tested for efficacy by an NRTL and registered by the EPA for use in HVAC systems.

4. Water-Based Liner Adhesive: Comply with NFPA 90A or NFPA 90B and with ASTM C 916.

a. Use adhesive that has a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Insulation Pins and Washers:

1. Cupped-Head, Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.106-inch- diameter shank, length to suit depth of insulation indicated with integral 1-1/2-inch galvanized carbon-steel washer.

2. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick stainless steel; with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.

D. Shop Application of Duct Liner: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-19, "Flexible Duct Liner Installation."

1. Adhere a single layer of indicated thickness of duct liner with at least 90 percent adhesive coverage at liner contact surface area. Attaining indicated thickness with multiple layers of duct liner is prohibited.
2. Apply adhesive to transverse edges of liner facing upstream that do not receive metal nosing.
3. Butt transverse joints without gaps, and coat joint with adhesive.
4. Fold and compress liner in corners of rectangular ducts or cut and fit to ensure butted-edge overlapping.
5. Do not apply liner in rectangular ducts with longitudinal joints, except at corners of ducts, unless duct size and dimensions of standard liner make longitudinal joints necessary.
6. Apply adhesive coating on longitudinal seams in ducts with air velocity of 2500 fpm (12.7 m/s).
7. Secure liner with mechanical fasteners 4 inches (100 mm) from corners and at intervals not exceeding 12 inches (300 mm) transversely; at 3 inches (75 mm) from transverse joints and at intervals not exceeding 18 inches (450 mm) longitudinally.
8. Secure transversely oriented liner edges facing the airstream with metal nosings that have either channel or "Z" profiles or are integrally formed from duct wall. Fabricate edge facings at the following locations:

    a. Fan discharges.
    b. Intervals of lined duct preceding unlined duct.
    c. Upstream edges of transverse joints in ducts where air velocities are higher than 2500 fpm or where indicated.

9. Secure insulation between perforated sheet metal inner duct of same thickness as specified for outer shell. Use mechanical fasteners that maintain inner duct at uniform distance from outer shell without compressing insulation.

    a. Sheet Metal Inner Duct Perforations: 3/32-inch diameter, with an overall open area of 23 percent.

10. Terminate inner ducts with buildouts attached to fire-damper sleeves, dampers, turning vane assemblies, or other devices. Fabricated buildouts (metal hat sections) or other buildout means are optional; when used, secure buildouts to duct walls with bolts, screws, rivets, or welds.

2.5 SEALANT AND GASKETS

A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets must be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.

B. Two-Part Tape Sealing System:

1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
2. Tape Width: 4 inches
3. Sealant: Modified styrene acrylic.
4. Water resistant.
5. Mold and mildew resistant.
6. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
7. Service: Indoor and outdoor.
8. Service Temperature: Minus 40 to plus 200 deg F
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.
10. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Water-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Solids Content: Minimum 65 percent.
3. Shore A Hardness: Minimum 20.
4. Water resistant.
5. Mold and mildew resistant.
6. VOC: Maximum 75 g/L (less water).
7. Maximum Static-Pressure Class: 10-inch wg (2500 Pa), positive and negative.
8. Service: Indoor or outdoor.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

D. Flanged Joint Sealant: Comply with ASTM C 920.

1. General: Single-component, acid-curing, silicone, elastomeric.
2. Type: S.
3. Grade: NS.
4. Class: 25.
5. Use: O.

6. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

E. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

F. Round Duct Joint O-Ring Seals:

1. Seal must provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wg (0.14 L/s per sq. m at 250 Pa) and must be rated for 10-inch wg (2500-Pa) static-pressure class, positive or negative.
2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.
3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

2.6 HANGERS AND SUPPORTS

A. Hanger Rods for Non-Corrosive Environments: Electro galvanized steel rods and nuts.

B. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1 (Table 4-1M), "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct."

C. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.

D. Steel Cables for Stainless-Steel and Aluminum Ducts: Stainless steel complying with ASTM A 492.

E. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.

F. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

G. Trapeze and Riser Supports:

1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
2. Supports for Stainless-Steel Ducts: Stainless-steel shapes and plates.
3. Supports for Aluminum Ducts: Aluminum or stainless steel.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 DUCT INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.

B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.

C. Install round ducts in maximum practical lengths.

D. Install ducts with fewest possible joints.

E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.

F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.

G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

H. Install ducts with a clearance of 1 inch (25 mm), plus allowance for insulation thickness.

I. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.

J. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches (38 mm).

K. Where ducts pass through fire-rated interior partitions and exterior walls, install fire dampers. Comply with requirements in Section 23 33 00 "Air Duct Accessories" for fire and smoke dampers.

L. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "Duct Cleanliness for New Construction Guidelines."

3.3 INSTALLATION OF EXPOSED DUCTWORK

A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.

B. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.

C. Grind welds to provide smooth surface free of burrs, sharp edges, and weld splatter. When welding stainless steel with a No. 3 or 4 finish, grind the welds flush, polish the exposed welds, and treat the welds to remove discoloration caused by welding.

D. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.

E. Repair and restore or replace damaged sections and finished work that does not comply with these requirements.

3.4 DUCT SEALING

A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

B. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":

1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
2. Seal class of ducts must be in compliant with 2020 NYCECC as scheduled on plans.

3.5 HANGER AND SUPPORT INSTALLATION

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Hangers and Supports."

B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.

1. Where practical, install concrete inserts before placing concrete.
2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
5. Do not use powder-actuated concrete fasteners for seismic restraints.

C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1 "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.

D. Hangers Exposed to View: Threaded rod and angle or channel supports.

E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.

F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.6 CONNECTIONS

A. Make connections to equipment with flexible connectors complying with Section 233300 "Air Duct Accessories."

B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.7 DUCT CLEANINESS

A. All ductwork openings must be taped closed with polyethylene when delivered to site. All installed hung ducts openings must be protected from construction dust. All open end return duct opening must be protected until ready for use.

B. Clean the following components by removing surface contaminants and deposits:

1. Air outlets and inlets (registers, grilles, and diffusers).
2. Supply, return, and exhaust fans including fan housings, plenums (except ceiling supply and return plenums), scrolls, blades or vanes, shafts, baffles, dampers, and drive assemblies.
3. Air-handling unit internal surfaces and components including mixing box, coil section, air wash systems, spray eliminators, condensate drain pans, humidifiers and dehumidifiers, filters and filter sections, and condensate collectors and drains.
4. Coils and related components.
5. Return-air ducts, dampers, actuators, and turning vanes except in ceiling plenums and mechanical equipment rooms.
6. Supply-air ducts, dampers, actuators, and turning vanes.
7. Dedicated exhaust and ventilation components and makeup air systems.

C. Provide temporary MERV 11 construction filters and run continuously for 48 hours to clean system of construction debris or dust.

3.8 START UP

A. Air Balance: Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC."

3.9 DUCT SCHEDULE

A. Supply, Return or Exhaust Ducts:

1. Ducts Connected to Air-Conditioning Units, Return Fans and Exhaust Fans
   a. Material: Galvanized Steel
   b. Pressure Class: Positive or negative 2-inch wg.
   c. Minimum SMACNA Seal Class: A
   d. SMACNA Leakage Class for Rectangular: 6
   e. SMACNA Leakage Class for Round and Flat Oval: 6

B. Intermediate Reinforcement:

1. Galvanized-Steel Ducts: Galvanized steel or carbon steel coated with zinc-chromate primer.

2. Aluminum Ducts: Aluminum.

C. Liner:

1. Supply and Return: Fibrous glass, Type I, thickness minimum 1 inch unless otherwise noted on plans.
2. Transfer Ducts: Fibrous glass, Type I, thickness minimum 1-1/2 inch unless otherwise noted on plans.
3. Provide sound linings on all supply and return ductwork within mechanical rooms but not less than 15 ft from each fan.
4. Sound lined boots at return and exhaust registers.
5. Provide sound linings minimum 10ft downstream of all terminal devices.

D. Elbow Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Elbows."

   a. Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
   b. Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.
   c. Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-3, "Vanes and Vane Runners," and Figure 2-4, "Vane Support in Elbows."

2. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-3, "Round Duct Elbows."

a. Minimum Radius-to-Diameter Ratio and Elbow Segments: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 3-1, "Mitered Elbows." Elbows with less than 90-degree change of direction have proportionately fewer segments.

1) Radius-to Diameter Ratio: 1.5

b. Round Elbows, 12 Inches and Smaller in Diameter: Stamped or pleated.

E. Branch Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-6, "Branch Connections."

a. Rectangular Main to Rectangular Branch: 45-degree entry.
b. Rectangular Main to Round Branch: Spin in.

2. Round: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "90 Degree Tees and Laterals," and Figure 3-5, "Conical Tees." Saddle taps are not permitted.

a. Velocity 1500 fpm or Lower: Conical tap.
b. Velocity 1500 fpm or Higher: 45-degree lateral.

END OF SECTION 23 31 13

SECTION 23 33 00 - AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section Includes:
1. Backdraft and pressure relief dampers.
2. Manual volume dampers.
3. Remote damper operators
4. Control dampers.
5. Fire dampers.
6. Flange connectors.
7. Turning vanes.
8. Duct-mounted access doors.
9. Flexible connectors.
10. Flexible ducts.
11. Duct accessory hardware.
12. Constant Airflow Regulator (CAR)
13. Exhaust Ventilator (Rain Cap)

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For duct accessories. Include plans, elevations, sections, details and attachments to other work.
1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:
a. Special fittings.
b. Manual volume damper installations.

c. Control damper installations.
d. Fire-damper and smoke-damper installations, including sleeves; and duct-mounted access doors.
e. Wiring Diagrams: For power, signal, and control wiring.

C. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

C. Comply with AMCA 500-D testing for damper rating.

1.6 WARRANTY

A. Manufacturer must provide warranty for a period of one year from substantial completion. Warranty must cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer’s written instructions for installation, operation and maintenance have been followed.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials must be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
1. Galvanized Coating Designation: G90
2. Exposed-Surface Finish: Mill phosphatized.

C. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304, and having a No. 2 finish for concealed ducts and for exposed ducts.

D. Aluminum Sheets: Comply with ASTM B 209, Alloy 3003, Temper H14; with mill finish for concealed ducts and standard, 1-side bright finish for exposed ducts.

E. Extruded Aluminum: Comply with ASTM B 221, Alloy 6063, Temper T6.

F. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.

G. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.2 BACKDRAFT AND PRESSURE RELIEF DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Air Balance Inc.; a division of Mestek, Inc.
   2. American Warming and Ventilating; a division of Mestek, Inc.
   3. Duro Dyne Inc.
   4. Greenheck Fan Corporation.
   5. Nailor Industries Inc.
   6. Ruskin Company.
   7. Or approved equal.

B. Description: Gravity balanced.

C. Maximum Air Velocity: 2000 fpm

D. Maximum System Pressure: 2-inch wg

E. Frame: 0.052-inch- (1.3-mm-) thick, galvanized sheet steel, with welded corners and mounting flange.

F. Blades: Multiple single-piece blades, center-pivoted, maximum 6-inch width, 0.025-inch-thick, roll-formed aluminum noncombustible, tear-resistant, neoprene-coated fiberglass with sealed edges.

G. Blade Action: Parallel.

H. Blade Seals: Neoprene, mechanically locked.

I. Blade Axles:
   1. Material: Aluminum.
   2. Diameter: 0.20 inch

J. Tie Bars and Brackets: Aluminum

K. Return Spring: Adjustable tension.

L. Bearings: Steel ball.

M. Accessories:

1. Adjustment device to permit setting for varying differential static pressure.
2. Counterweights and spring-assist kits for vertical airflow installations.
3. Electric actuators.
4. Chain pulls.
5. Screen Mounting: Front mounted in sleeve.
   a. Sleeve Thickness: 20-gage minimum.
   b. Sleeve Length: 6 inches minimum.
6. Screen Mounting: Rear mounted.
7. Screen Material: Aluminum.
8. Screen Type: Bird
9. 90-degree stops.

2.3 MANUAL VOLUME DAMPERS

A. Standard, Steel, Manual Volume Dampers:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Air Balance Inc.; a division of Mestek, Inc.
      b. American Warming and Ventilating; a division of Mestek, Inc.
      c. Nailor Industries Inc.
      d. Pottorff; a division of PCI Industries, Inc.
      e. Ruskin Company.
      f. Or approved equal
   2. Standard leakage rating, with linkage outside airstream.
   3. Suitable for horizontal or vertical applications.
   4. Frames:
      a. Hat-shaped, galvanized-steel channels, 0.064-inch (1.62-mm) minimum thickness.
      b. Mitered and welded corners.
      c. Flanges for attaching to walls and flangeless frames for installing in ducts.
   5. Blades:
      a. Multiple or single blade.
      b. Parallel- or opposed-blade design.
      c. Stiffen damper blades for stability.
      d. Galvanized steel, 0.064 inch (1.62 mm) thick.
   6. Blade Axles: Galvanized steel.
   7. Bearings:
      a. Molded synthetic
      b. Dampers in ducts with pressure classes of 3-inch wg (750 Pa) or less must have axles full length of damper blades and bearings at both ends of operating shaft.
   8. Tie Bars and Brackets: Galvanized steel.

B. Standard, Aluminum, Manual Volume Dampers:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Air Balance Inc.; a division of Mestek, Inc.

b. American Warming and Ventilating; a division of Mestek, Inc.
c. Nailor Industries Inc.
d. Pottorff; a division of PCI Industries, Inc.
e. Ruskin Company.
f. Or approved equal.

2. Standard leakage rating, with linkage outside airstream.
3. Suitable for horizontal or vertical applications.
4. Frames: Hat-shaped, 0.10-inch- (2.5-mm-) thick, aluminum sheet channels; frames with flanges for attaching to walls and flangeless frames for installing in ducts.
5. Blades:
   a. Multiple or single blade.
   b. Parallel- or opposed-blade design.
   c. Stiffen damper blades for stability.
   d. Roll-Formed Aluminum Blades: 0.10-inch- (2.5-mm-) thick aluminum sheet.
   e. Extruded-Aluminum Blades: 0.050-inch- (1.2-mm-) thick extruded aluminum.
6. Blade Axles: Galvanized steel
7. Bearings:
   a. Molded synthetic
   b. Dampers in ducts with pressure classes of 3-inch wg (750 Pa) or less must have axles full length of damper blades and bearings at both ends of operating shaft.
8. Tie Bars and Brackets: Aluminum.

C. Jackshaft:
1. Size: 1-inch (25-mm) diameter.
2. Material: Galvanized-steel pipe rotating within pipe-bearing assembly mounted on supports at each mullion and at each end of multiple-damper assemblies.
3. Length and Number of Mountings: As required to connect linkage of each damper in multiple-damper assembly.

D. Damper Hardware:
1. Zinc-plated, die-cast core with dial and handle made of 3/32-inch- (2.4-mm-) thick zinc-plated steel, and a 3/4-inch (19-mm) hexagon locking nut.
2. Include center hole to suit damper operating-rod size.
3. Include elevated platform for insulated duct mounting.

2.4 REMOTE DAMPER OPERATORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Pottorff; a division of PCI Industries, Inc.
2. Ventfabrics, Inc.
3. Young Regulator Company.
4. Or approved equal.

B. Description: Cable system designed for remote manual damper adjustment.

C. Tubing: Brass.

D. Cable: Stainless steel.

E. Wall-Box Mounting: Recessed, 3/4 inches deep.

F. Wall-Box Cover-Plate Material: Stainless steel.

2.5 FIRE DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Air Balance Inc.; a division of Mestek, Inc.
   2. Greenheck Fan Corporation.
   3. Nailor Industries Inc.
   4. Ruskin Company.
   5. Or approved equal.

B. Type: Static and dynamic; rated and labeled according to UL 555 by an NRTL.

C. Closing rating in ducts up to 4-inch wg static pressure class and minimum 4000-fpm velocity.

D. Fire Rating: 1-1/2 hours.

E. Frame: Curtain type with blades outside airstream; fabricated with roll-formed, 0.034-inch-(0.85-mm-) thick galvanized steel; with mitered and interlocking corners.

F. Mounting Sleeve: Factory- or field-installed, galvanized sheet steel.
   1. Minimum Thickness: 0.052 thick, as indicated, and of length to suit application.
   2. Exception: Omit sleeve where damper-frame width permits direct attachment of perimeter mounting angles on each side of wall or floor; thickness of damper frame must comply with sleeve requirements.

G. Mounting Orientation: Vertical or horizontal as indicated.

H. Blades: Roll-formed, interlocking, 0.034-inch thick, galvanized sheet steel. In place of interlocking blades, use full-length, 0.034-inch thick, galvanized-steel blade connectors.

I. Horizontal Dampers: Include blade lock and stainless-steel closure spring.

J. Heat-Responsive Device: Replaceable, 165 deg F rated, fusible links.

K. Heat-Responsive Device: Electric resettable link and switch package, factory installed, 165 deg F rated where noted on plans

2.6 FLANGE CONNECTORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Ductmate Industries, Inc.
   2. Nexus PDQ; Division of Shilco Holdings Inc.
   3. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
   4. Or approved equal.

B. Description: Roll-formed, factory-fabricated, slide-on transverse flange connectors, gaskets, and components.

C. Material: Galvanized steel.

D. Gage and Shape: Match connecting ductwork.

2.7 TURNING VANES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Ductmate Industries, Inc.
   2. Duro Dyne Inc.
   3. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
   4. Or approved equal.

B. Manufactured Turning Vanes for Metal Ducts: Curved blades of galvanized sheet steel; support with bars perpendicular to blades set; set into vane runners suitable for duct mounting.
   1. Acoustic Turning Vanes: Fabricate airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.

C. General Requirements: Comply with SMACNA "HVAC Duct Construction Standards - Metal and Flexible"; Figures 2-3, "Vanes and Vane Runners," and 2-4, "Vane Support in Elbows."

D. Vane Construction: Single wall.

2.8 DUCT-MOUNTED ACCESS DOORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. American Warming and Ventilating; a division of Mestek, Inc.
   2. Ductmate Industries, Inc.
   3. Greenheck Fan Corporation.
   4. Nailor Industries Inc.
   5. Pottorff; a division of PCI Industries, Inc.
   6. Or approved equal.

B. Duct-Mounted Access Doors: Fabricate access panels according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"; Figures 2-10, "Duct Access Doors and Panels," and 2-11, "Access Panels - Round Duct."
   1. Door:
      a. Double wall, rectangular.
      b. Galvanized sheet metal with insulation fill and thickness as indicated for duct pressure class.
      c. Vision panel, where noted on plans.
      d. Hinges and Latches: 1-by-1-inch (25-by-25-mm) butt or piano hinge and cam latches.
      e. Fabricate doors airtight and suitable for duct pressure class.
   2. Frame: Galvanized sheet steel, with bend-over tabs and foam gaskets.
   3. Number of Hinges and Locks:
      a. Access Doors Less Than 12 Inches (300 mm) Square: No hinges and two sash locks.
      b. Access Doors up to 18 Inches (460 mm) Square: Two hinges and two sash locks.
      c. Access Doors Larger Than 24 by 48 Inches (600 by 1200 mm): Four hinges and two compression latches with outside and inside handles.

2.9 DUCT ACCESS PANEL ASSEMBLIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Ductmate Industries, Inc.
   2. Flame Gard, Inc.
   3. 3M.
   4. Or approved equal.

B. Labeled according to UL 1978 by an NRTL.

C. Panel and Frame: Minimum thickness 0.0528-inch carbon steel.

D. Fasteners: Carbon steel. Panel fasteners must not penetrate duct wall.

E. Gasket: Comply with NFPA 96; grease-tight, high-temperature ceramic fiber, rated for minimum 2000 deg F (1093 deg C).

F. Minimum Pressure Rating: 10-inch wg (2500 Pa), positive or negative.

2.10 FLEXIBLE CONNECTORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Ductmate Industries, Inc.
   2. Duro Dyne Inc.

3. Ventfabrics, Inc.
4. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
5. Or approved equal.

B. Materials: Flame-retardant or noncombustible fabrics.

C. Coatings and Adhesives: Comply with UL 181, Class 1.

D. Metal-Edged Connectors: Factory fabricated with a fabric strip 3-1/2 inches wide attached to 2 strips of 2-3/4-inch- (70-mm-) wide, 0.028-inch- (0.7-mm-) thick, galvanized sheet steel or 0.032-inch- (0.8-mm-) thick aluminum sheets. Provide metal compatible with connected ducts.

E. Indoor System, Flexible Connector Fabric: Glass fabric double coated with neoprene.
1. Minimum Weight: 26 oz./sq. yd. (880 g/sq. m).
2. Tensile Strength: 480 lbf/inch (84 N/mm) in the warp and 360 lbf/inch (63 N/mm) in the filling.
3. Service Temperature: Minus 40 to plus 200 deg F (Minus 40 to plus 93 deg C).

F. Outdoor System, Flexible Connector Fabric: Glass fabric double coated with weatherproof, synthetic rubber resistant to UV rays and ozone.
1. Minimum Weight: 24 oz./sq. yd. (810 g/sq. m).
2. Minimum Tensile Strength: 500 lbf/inch (88 N/mm) in the warp and 440 lbf/inch (77 N/mm) in the filling.
3. Service Temperature: Minus 50 to plus 250 deg F (Minus 45 to plus 121 deg C).

G. Thrust Limits: Combination coil spring and elastomeric insert with spring and insert in compression, and with a load stop. Include rod and angle-iron brackets for attaching to fan discharge and duct.
1. Frame: Steel, fabricated for connection to threaded rods and to allow for a maximum of 30 degrees of angular rod misalignment without binding or reducing isolation efficiency.
2. Outdoor Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
6. Elastomeric Element: Molded, oil-resistant rubber or neoprene.
7. Coil Spring: Factory set and field adjustable for a maximum of 1/4-inch (6-mm) movement at start and stop.

2.11 FLEXIBLE DUCTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Flexmaster U.S.A., Inc.
2. McGill AirFlow LLC.

3. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
4. Or approved equal.

B. Noninsulated, Flexible Duct: UL 181, Class 1, multiple layers of aluminum laminate supported by helically wound, spring-steel wire.
1. Pressure Rating: 10-inch wg (2500 Pa) positive and 1.0-inch wg (250 Pa) negative.
2. Maximum Air Velocity: 4000 fpm (20 m/s).
3. Temperature Range: Minus 20 to plus 210 deg F (Minus 29 to plus 99 deg C).

C. Insulated, Flexible Duct: UL 181, Class 1, aluminum laminate and polyester film with latex adhesive supported by helically wound, spring-steel wire; fibrous-glass insulation; aluminized vapor-barrier film.
1. Pressure Rating: 10-inch wg (2500 Pa) positive and 1.0-inch wg (250 Pa) negative.
2. Maximum Air Velocity: 4000 fpm (20 m/s).
3. Temperature Range: Minus 20 to plus 210 deg F (Minus 29 to plus 99 deg C).
4. Insulation R-value: Comply with ASHRAE/IESNA 90.1-2007

D. Flexible Duct Connectors:
1. Clamps: Stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action in sizes 3 through 18 inches (75 through 460 mm), to suit duct size.

2.12 DUCT ACCESSORY HARDWARE

A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.

B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

2.13 CONSTANT AIRFLOW REGULATOR (CAR)

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. American Aldes Ventilation Corporation.
2. Young Regulator Company.
3. Hidria.
4. Or approved equal.

B. Constant airflow regulators must solely operate on duct pressure and require no external power supply. Each regulator must be pre-set and factory calibrated, requiring no field adjustment to the airflows as indicated on the drawings, and must be rated for use in air temperatures ranging from -25° to 140°F.

C. Constant Airflow Regulators must be capable of maintaining constant airflow within ±10% of scheduled flow rates, within the operating range of 0.2 to 0.8 in. w.g. differential pressure, or 0.6 to 2.4 in. w.g. on high-pressure models, or 0.1 to 0.42 in. w.g. on low-pressure models. Regulators must be provided as an assembly consisting of an ABS plastic body housed within a round sleeve for mounting in round duct. Each round sleeve must be fitted with a lip gasket to ensure perimeter air tightness with the interior surface of the duct. All regulators must be classified per UL 2043 and carry the UL mark indicating compliance. All Constant Airflow Regulators will require no maintenance.

2.14 EXAHUST VENTILATOR (RAIN CAP)

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Greenheck.
   2. Loren Cook
   3. Penn Barry
   4. Or approved equal.

B. General Description:
   1. Ventilator is low silhouette for exhaust applications.

C. Hood:
   1. Constructed of aluminum
   2. Internal structure is constructed of galvanized steel

D. Birdscreen:
   1. Constructed of ½ inch galvanized steel mesh.
   2. Mounted horizontally across the intake area of the hood

E. Housing
   1. Curb Cap type: Not Hinged.
   2. Constructed of aluminum, includes windband and curb cap. Galvanized material is not acceptable
   3. Windband to be one piece spun aluminum construction and maintain original material thickness throughout the housing.
   4. Windband to include an integral rolled bead for strength
   5. Curb cap to have integral deep spun inlet venturi and prepunched mounting holes to ensure correct attachment to roof.

F. Accessories:
   1. Curb Seal:
      a. Rubber seal between fan and the roof curb

G. Roof Curb:
   1. Type: Welded, straight sided curb with 2 inches of flashing flange and wood nailer.

2. Mounted onto roof
3. Material: Galvalume
4. Insulation thickness: No insulation.
5. Flashing Flange:2 inch
6. Coating Type: Hi-Pro Polyester

H. Finishes:
1. Hi-Pro Polyester

PART 3 - INSTALLATION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.

B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.

C. Install backdraft dampers at inlet of exhaust fans or exhaust ducts as close as possible to exhaust fan unless otherwise indicated.

D. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.
1. Install steel volume dampers in steel ducts.
2. Install aluminum volume dampers in aluminum ducts.

E. Set dampers to fully open position before testing, adjusting, and balancing.

F. Install test holes at fan inlets and outlets and elsewhere as indicated.

G. Install fire dampers according to UL listing.

H. Install duct access doors on sides of ducts to allow for inspecting, adjusting, and maintaining accessories and equipment at the following locations:
1. On both sides of duct coils.
2. Upstream and downstream from duct filters.

3. At outdoor-air intakes and mixed-air plenums.
4. At drain pans and seals.
5. Downstream from manual volume dampers, control dampers, backdraft dampers, and equipment.
6. Adjacent to and close enough to fire or smoke dampers, to reset or reinstall fusible links. Access doors for access to fire or smoke dampers having fusible links must be pressure relief access doors; and must be outward operation for access doors installed upstream from dampers and inward operation for access doors installed downstream from dampers.
7. At each change in direction and at maximum 50-foot (15-m) spacing.
8. Upstream and downstream from turning vanes.
9. Control devices requiring inspection.
10. Elsewhere as indicated.

I. Install access doors with swing against duct static pressure.

J. Access Door Sizes:
1. One-Hand or Inspection Access: 8 by 5 inches.
2. Two-Hand Access: 12 by 6 inches.

K. Label access doors according to Section 230553 "Identification for HVAC Piping and Equipment" to indicate the purpose of access door.

L. Install flexible connectors to connect ducts to equipment.

M. For fans developing static pressures of 4-inch wg (1250 Pa) and more, cover flexible connectors with loaded vinyl sheet held in place with metal straps.

N. Connect terminal units to supply duct directly or with maximum 8-inch lengths of flexible duct. Do not use flexible ducts to change directions.

O. Connect diffusers or light troffer boots to ducts directly or with maximum 24-inch lengths of flexible duct clamped or strapped in place.

P. Connect flexible ducts to metal ducts with draw bands

Q. Install duct test holes where required for testing and balancing purposes.

R. Install thrust limits at centerline of thrust, symmetrical on both sides of equipment. Attach thrust limits at centerline of thrust and adjust to a maximum of 1/4-inch (6-mm) movement during start and stop of fans.

3.3 FIELD QUALITY CONTROL

A. Tests and Inspections:
1. Operate dampers to verify full range of movement.

2. Inspect locations of access doors and verify that purpose of access door can be performed.
3. Operate fire and smoke dampers to verify full range of movement and verify that proper heat-response device is installed.
4. Inspect turning vanes for proper and secure installation.

END OF SECTION 23 33 00

SECTION 23 34 16 – CENTRIFUGAL HVAC FANS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. This Section includes the following:
   1. Inline Cabinet Centrifugal Exhaust Fan.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: Include rated capacities, furnished specialties, and accessories for each type of product indicated and include the following:

   1. Certified fan performance curves with system operating conditions indicated.
   2. Certified fan sound-power ratings.
   3. Motor ratings and electrical characteristics, plus motor and electrical accessories.
   4. Material thickness and finishes, including color charts.
   5. Dampers, including housings, linkages, and operators.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

   1. Wiring Diagrams: Power, signal, and control wiring.
   2. Design Calculations: Calculate requirements for selecting vibration isolators and seismic restraints and for designing vibration isolation bases.
   3. Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include auxiliary motor slides and rails, and base weights.

C. Coordination Drawings: Show fan room layout and relationships between components and adjacent structural and mechanical elements. Show support locations, type of support, and weight on each support. Indicate and certify field measurements.

D. Field quality-control test reports.

E. Operation and Maintenance Data: To include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100.

C. AMCA Compliance: Products must comply with performance requirements and must be licensed to use the AMCA-Certified Ratings Seal.

D. NEMA Compliance: Motors and electrical accessories must comply with NEMA 1.

1.6 PERFORMANCE REQUIREMENTS

A. Project Altitude: Base fan performance ratings on actual Project site elevations above sea level.

B. Operating Limits: Classify according to AMCA 99.

1.7 WARRANTY

A. Manufacturers must provide a warranty for a period of one year from substantial completion. The warranty must cover material and workmanship that prove defective within the specified warranty period, provided manufacturer’s written instructions for installation, operation and maintenance have been followed.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver fans as factory-assembled units, to the extent allowable by shipping limitations, with protective crating and covering.

B. Disassemble and reassemble units, as required for moving to the final location, according to manufacturer's written instructions.

C. Lift and support units with manufacturer's designated lifting or supporting points.

1.9 COORDINATION

A. Coordinate size and location of structural-steel support members.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products by one of the following:
   1. Greenheck.
   2. Loren Cook.
   3. Twin City Fan Companies.

4. Barry Blower.
5. Or approved equal.

2.2 DIRCET DRIVE BACKWARD INCLINED INLINE FANS

A. Fan must be designed for quiet operation.

B. Wheel:
1. Non-overloading, backward inclined centrifugal wheel.
2. Constructed of aluminum.
3. Statically and dynamically balanced in accordance to AMCA Standard 204-05.
4. The wheel cone and fan inlet will be matched and must have precise running tolerances for maximum performance and operating efficiency.
5. Single thickness blades are securely riveted or welded to a heavy gauge back plate and wheel cone.

C. Electronically Commutated Motor
1. Motor enclosures: Open type.
2. Motor to be a DC electronic commutation type motor (ECM) specifically designed for fan applications. AC induction type motors are not acceptable. Examples of unacceptable motors are: Shaded Pole, Permanent Split Capacitor (PSC), Split Phase, Capacitor Start and 3 phase induction type motors.
3. Motors are permanently lubricated, heavy duty ball bearing type to match with the fan load and pre-wired to the specific voltage and phase.
4. Internal motor circuitry to convert AC power supplied to the fan to DC power to operate the motor.
5. Motor must be speed controllable down to 20% of full speed (80% turndown). Speed must be controlled by either a potentiometer dial mounted at the motor or by a 0-10 VDC signal.
6. Motor must be a minimum of 85% efficient at all speeds.

D. Housing and Cabinet Construction
1. The fan housing must be of the square design constructed of heavy gauge galvanized steel and must include square duct mounting collars.
2. Housing and bearing supports must be constructed of heavy gauge bolted and welded steel construction to prevent vibration and to rigidly support the shaft and bearing assembly.
3. Fans construction must include two removable access panels located perpendicular to the motor mounting panel. The access panels must be of sufficient size to permit easy access to all interior components.

E. Provide spring type vibration isolators.

F. Accessories
1. Combination Smart Starter / Disconnect - NEMA-1 rated, positive electrical shut-off
2. Wired from motor to junction box.
3. Vibration Kit.
4. Motorized damper interlocked with fan.

2.3 DIRECT DRIVE ROOF MOUNTED EXHAUST FAN

A. General Description:
   1. Downblast fan must be for roof mounted applications.
   2. Maximum continuous operating temperature is 180-degree F.
   3. Each fan must bear a permanently affixed manufacturer's engraved metal nameplate containing the model number and individual serial number.

B. Wheel:
   1. Constructed of aluminum
   2. Non-overloading, backward inclined centrifugal.
   3. Statically and dynamically balanced in accordance with AMCA Standard 204-05.
   4. The wheel cone and fan inlet will be matched and must have precise running tolerances for maximum performance and operating efficiency.

C. Electronically Commutated Motor
   1. Motor enclosures: Open type
   2. Motor to be a DC electronic commutation type motor (ECM) specifically designed for fan applications. AC induction type motors are not acceptable. Examples of unacceptable motors are: Shaded Pole, Permanent Split Capacitor (PSC), Split Phase, Capacitor Start and 3 phase induction type motors.
   3. Motors are permanently lubricated, heavy duty ball bearing type to match with the fan load and pre-wired to the specific voltage and phase.
   4. Internal motor circuitry to convert AC power supplied to the fan to DC power to operate the motor.
   5. Motor must be speed controllable down to 20% full speed (80% turndown). Speed must be controlled by either a potentiometer dial mounted at the motor or by a 0-10 VDC signal.
   6. Motor must be a minimum of 85% efficient at all speeds.
   7. Factory programed, mounted and wired.
   8. Input speed control via potentiometer dial.
   9. R3 Filtering for harmonic mitigation.
   10. UL Recognized for 3 phase input at 208V or 380-480V.
   11. NEMA 4X Enclosure.
   12. LED indication for Power, Run, and Fault.

D. Housing
   1. Motor cover, shroud, curb cap, and lower windband must be constructed of heavy gauge aluminum.
   2. Shroud must have an integral rolled bead for extra strength.
   3. Shroud must be drawn from a disc and direct air downward.
   4. Lower windband must have a formed edge for added strength.
   5. Motor cover must be drawn from a disc.
   6. All housing components must have final thicknesses equal to or greater than preformed thickness.
   7. Curb cap must have pre-punched mounting holes to ensure correct attachment.
   8. Rigid internal support structure.
   9. Leak proof.

E. Housing Supports and Drive Frame

1. Drive frame assemblies must be constructed of heavy gauge steel and mounted on vibration isolators.

F. Vibration Isolation
1. Rubber isolators
2. Sized to match the weight of each fan.

G. Accessories
1. Disconnect Switch- NEMA-1 rated, positive electrical shut-off.
2. Motorized damper interlocked with fan.
3. Stainless steel bird screen
4. Roof Curb: Galvanized, 2-inch thick insulation, Type to match roofing requirements
5. Hinge Kit: Allows the fan to tilt away for access to wheel and ductwork for inspection and cleaning.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Install fans level and plumb.

B. Vibration- control devices are specified in Section 23 05 48.13 "Vibration Control for HVAC."

C. Install units with clearances for service and maintenance.

D. Label fans according to requirements specified in Section 23 05 53 "Identification for HVAC Piping and Equipment."

3.3 CONNECTIONS

A. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors. Flexible connectors are specified in Section 23 33 00"Air Duct Accessories."

B. Install ducts adjacent to fans to allow service and maintenance.

C. Ground equipment according to Section 26 05 26 "Grounding and Bonding for Electrical Systems."

D. Connect wiring according to Section 26 05 19 "Low Voltage Electrical Power Conductors and Cables."

3.4 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:

1. Verify that shipping, blocking, and bracing are removed.
2. Verify that unit is secure on mountings and supporting devices and that connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
3. Verify that cleaning and adjusting are complete.
4. Verify that manual and automatic volume control and fire and smoke dampers in connected ductwork systems are in fully open position.
5. Refer to Section 23 05 93 "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing procedures.
6. Remove and replace malfunctioning units and retest as specified above.

B. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

END OF SECTION 23 34 16

SECTION 23 37 13 - DIFFUSERS, REGISTERS, AND GRILLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section Includes:
1. Ceiling Linear Slot Outlets.
2. Linear Bar Grilles Inlets and Outlets.
3. Supply and Return Louvered Grille.
4. Plaque Ceiling Diffuser.

B. Related Sections:
1. Section 23 33 00 – “Air Duct Accessories” for fire and smoke dampers and volume-control dampers not integral to diffusers, registers, and grilles.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated, include the following:
1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
2. Diffuser, Register, and Grille Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.

B. Samples: For each exposed product and for each color and texture specified.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Verification of Performance: Rate diffusers, registers, and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

1.6 WARRANTY

A. Manufacturers must provide one year warranty from date of Substantial Completion. The warranty must cover material and workmanship that prove defective, provided manufacturer’s written instructions for installation, operation and maintenance have been followed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products by one of the following:
   1. Titus.
   2. Anemostat.
   3. Price Industries.
   4. Krueger.
   5. Or approved equal.

2.2 LINEAR BAR GRILLE INLET AND OUTLETS (LBG-1,2,3)

A. Linear bar diffusers must be with 1/8-inch thick fixed bars at 0° deflection, spaced ¼-inch on center. Linear bar diffusers must be available in standard one-piece lengths up to 6 feet and must have the sizes and mounting types shown on the plans and outlet schedule. Diffuser lengths greater than 6 feet must be furnished in multiple sections and will be joined together end-to-end with alignment strips or pins to form a continuous appearance. All alignment components to be provided by the manufacturer.

B. The diffuser core must have extruded aluminum bars locked into a heavy extruded aluminum border. The deflection bars must be fixed and parallel to the long dimension. The core must have support bars located no more than 9 inches apart and must be parallel to the short dimension.

C. The finish must be #26 white. The finish must be an anodic acrylic paint, baked at 315°F for 30 minutes. The pencil hardness must be HB to H.

D. The paint must pass a 100-hour ASTM B117 Corrosive Environments Salt Spray Test without creepage, blistering, or deterioration of film. The paint must pass a 250-hour ASTM D870 Water Immersion Test. The paint must also pass the ASTM D2794 Reverse Impact Cracking Test with a 50-inch pound force applied.

E. Heavy gauge extruded aluminum end borders and mitered corners must be available to close off the ends of the diffusers. Optional opposed blade damper must be constructed of heavy gauge steel (aluminum also available). Damper must be operable from the face of the diffuser. Optional directional blades and blank-offs must also be available. Optional diffuser curving to a 6-foot minimum radius on most models must be available as required.

F. The manufacturer must provide published performance data for the linear bar diffuser. The diffuser must be tested in accordance with ANSI/ASHRAE Standard 70-1991.

2.3 SUPPLY AND RETURN GRILLES (EG-1, RG-1,2, SG-2)

A. Steel supply grilles must be double deflection of the sizes and mounting types shown on the plans and outlet schedule. The deflection blades must be available parallel to the short dimension of the grille. Construction must be of steel with a 1¼-inch wide border on all sides. Screw holes must be countersunk for a neat appearance. Corners must be welded with full penetration resistance welds.

B. Steel return grilles must be ¾-inch blade spacing of the sizes and mounting types shown on the plans and outlet schedule. The fixed deflection blades must be available parallel to the long or short dimension of the grille. Construction must be of steel with a 1¼-inch wide border on all sides. Screw holes must be countersunk for a neat appearance. Corners must be welded with full penetration resistance welds.

C. Deflection blades must be contoured to a specifically designed and tested cross-section to meet published test performance data. Blades must be spaced on ¾-inch centers. Blades must have steel friction pivots on both ends to allow individual blade adjustment without loosening or rattling. Plastic blade pivots are not acceptable.

D. Optional opposed-blade volume damper must be constructed of heavy gauge steel. Damper must be operable from the face of the grille.

E. The grille finish must be #26 white. The finish must be an anodic acrylic paint, baked at 315°F for 30 minutes. The pencil hardness must be HB to H. The paint must pass a 100-hour ASTM B117 Corrosive Environments Salt Spray Test without creepage, blistering or deterioration of film. The paint must pass a 250-hour ASTM D870 Water Immersion Test. The paint must also pass the ASTM D2794 Reverse Impact Cracking Test with a 50-inch pound force applied.

F. The manufacturer must provide published performance data for the grille. The grille must be tested in accordance with ANSI/ASHRAE Standard 70-1991.

2.4 SPIRAL DUCT MOUNTED SUPPLY GRILLES (SG-1)

A. Aluminum supply grilles must be direct spiral duct-mounted supply grilles, double deflection for the sizes and mounting types as shown on the plans and outlet schedule. The deflection blades must be available parallel to the long or short dimension of the grille. All supply grilles must be constructed with radius end caps and foam gaskets for a tight seal to the duct diameter. All supply grilles must be constructed with a 1 3/8-inch wide border.

B. Blades must be constructed of heavy-duty extruded aluminum and must be spaced ¾-inch apart. Blades must extend completely through the side frame on each side to ensure stability throughout the complete cfm operating range of the grille. Blades must be individually adjustable without loosening or rattling and must be securely held in place with tension wire. (S8F: perforated face will have 3/16-inch holes on ¼-inch staggered centers.)

C. Air scoop damper/extractor must be constructed of heavy-duty aluminum. The ASD must be operable from the face with a screwdriver.

D. The grille finish must be #26 white. The finish must be an anodic acrylic paint, baked at 315°F for 30 minutes. The pencil hardness must be HB to H. The paint must pass a 100-hour ASTM B117 Corrosive Environments Salt Spray Test without creepage, blistering or deterioration of film. The paint must pass a 250-hour ASTM D870 Water Immersion Test. The paint must also pass the ASTM D2794 Reverse Impact Cracking Test with a 50-inch pound force applied.

E. The manufacturer must provide published performance data for the grille. The grille must be tested in accordance with ANSI/ASHRAE Standard 70-1991.

2.5 DOUBLE DEFLECTION ROUND GRILLE (CD-1,3)

A. Aluminum supply and return grilles must be round design, double deflection for the sizes and mounting types as shown on the plans and outlet schedule. All supply grilles must be constructed with a 1 1/2-inch wide border.

B. Grilles can be surface mounted, or duct mounted. Mounting bracket is installed and grille is inserted and rotated for quick mounting.

C. Blades spacing must be ¾ in. Blades must be individually adjustable without loosening or rattling and must be securely held in place with tension wire. Front louvers must be available in vertical or horizontal.

D. Optional Mounting Bracket and Damper available.

2.6 DOUBLE DEFLECTION ROUND GRILLE (CD-2)

A. Aluminum supply grilles must be round design, double deflection for the sizes and mounting types as shown on the plans and outlet schedule. All supply grilles must be constructed with a 1 1/2-inch wide border.

B. Blades must be constructed of heavy-duty extruded aluminum airfoil design and must be spaced ¾-inch apart. Blades must extend completely through the side frame on each side to ensure stability throughout the complete cfm operating range of the grille. Blades must be individually adjustable without loosening or rattling and must be securely held in place with tension wire.

C. The grille finish must be #26 white. The finish must be an anodic acrylic paint, baked at 315°F for 30 minutes. The pencil hardness must be HB to H. The paint must pass a 100-hour ASTM B117 Corrosive Environments Salt Spray Test without creepage, blistering or deterioration of film. The paint must pass a 250-hour ASTM D870 Water Immersion Test. The paint must also pass the ASTM D2794 Reverse Impact Cracking Test with a 50-inch pound force applied.

D. The manufacturer must provide published performance data for the grille. The grille must be tested in accordance with ANSI/ASHRAE Standard 70-1991.

2.7 PERFORATED EXHAUST GRILLE (EG-2)

A. Exhaust grilles must be round design for the sizes and mounting types as shown on the plans and outlet schedule. The face must be constructed of perforated aluminum with 3/16 -inch diameter holes on ¼-inch staggered centers to provide minimum 50 percent free area. Border width must be 1/2 inches on all sides and must have countersunk mounting holes.

B. Grille must be available in wall or ceiling mount and exposed duct mount.

C. The grille finish must be #26 white. The finish must be an anodic acrylic paint, baked at 315° F for 30 minutes. The pencil hardness must be HB to H. The paint must pass a 100-hour ASTM B117 Corrosive Environments Salt Spray Test without creepage, blistering or deterioration of film. The paint must pass a 250-hour ASTM D870 Water Immersion Test.

The paint must also pass the ASTM D2794 Reverse Impact Cracking Test with a 50-inch pound force applied.

D. The manufacturer must provide published performance data for the grille. The grille must be tested in accordance with ANSI/ASHRAE Standard 70-1991.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Install diffusers, registers, and grilles level and plumb.

B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practical. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Commissioner for a determination of final location.

C. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.3 ADJUSTING

A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION 23 37 13

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 23 63 13 – AIR-COOLED REFRIGERANT CONDENSER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. This section includes the design, controls and installation requirements for air-cooled condenser.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: Literature must be provided that indicates dimensions, operating and shipping weights, capacities, ratings, factory supplied accessories, electrical characteristics, and connection requirements. Installation, Operation and Maintenance manual with startup requirements must be provided.

B. Shop Drawings: Unit drawings must be provided that indicates assembly, unit dimensions, construction details, clearances, and connection details. Wiring diagram must be provided with details for both power and control systems and differentiate between factory installed and field installed wiring.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Unit must be certified in accordance with UL Standard 1995/CSA C22.2 No. 236, Safety Standard for Heating and Cooling Equipment.

C. Unit and refrigeration system must comply with ASHRAE 15, Safety Standard for Mechanical Refrigeration.

D. Energy Efficiency Ratio (EER) must be equal to or greater than prescribed by ASHRAE 90.1, Energy Efficient Design of New Buildings except Low-Rise Residential Buildings.

E. Unit must be safety certified by ETL and be ETL US and ETL Canada listed. Unit nameplate must include the ETL/ETL Canada label.

1.6 SEPCIAL REQUIREMENT

A. The condenser must be same manufacturer as dedicated outdoor air handling unit. Refer to specification section 23 74 33 – "Dedicated Outdoor-Air System".

1.7 DELIVERY STORAGE AND HANDLING

A. Unit must be shipped with doors bolted shut to prevent damage during transport and thereafter while in storage awaiting installation.

B. Follow Installation, Operation and Maintenance manual instructions for rigging, moving, and unloading the unit at its final location.

C. Unit must be stored in a clean, dry place protected from construction traffic in accordance with the Installation, Operation and Maintenance manual.

1.8 WARRANTY

A. Manufacturer must provide a limited "parts only" warranty for a period of 12 months from the date of substantial completion. Warranty must cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer's written instructions for installation, operation and maintenance have been followed. Warranty excludes parts associated with routine maintenance and refrigerant.

PART 2 - PRODUCTS

2.1 PACKAGED AIR-COOLED CONDENSER

A. Basis of Design Product: Subject to compliance with requirements, provide air cooled condenser by AAON or comparable product by one of the following:
   1. Trane.
   2. Carrier.
   3. Daikin McQuay.
   4. Or approved equal.

B. Compatible product must meet the following key features:
   1. Both the condenser and the air handler must be matched in performance and from single manufacturer.
   2. Both the condenser and the air handler must fit dimensionally and meet access and service requirements in the allocated space as outlined on the drawings.
   3. Both the condenser and the air handler must meet be equal or lower the noise levels scheduled on plans.

C. General Description:
   1. Condenser unit must include air-cooled condenser coils, condenser fans, suction and liquid connection valves and unit controls.
   2. Unit must be factory assembled and tested including leak testing of the coil and run testing of the completed unit. Run test report must be supplied with the unit in the controls compartment's literature pocket.
   3. Unit must have decals and tags to indicate lifting and rigging, service areas and caution areas for safety and to assist service personnel.
   4. Unit components must be labeled, including pipe stub outs, refrigeration system components and electrical and controls components.
   5. Installation, Operation and Maintenance manual must be supplied within the unit.
   6. Laminated color-coded wiring diagram must match factory installed wiring and must be affixed to the interior of the control compartment's access door.
   7. Unit nameplate must be provided in two locations on the unit, affixed to the exterior of the unit and affixed to the interior of the control compartment's access door.

D. Construction:
   1. Unit must be completely factory assembled, piped, and wired and shipped in one section.
   2. Unit must be specifically designed for outdoor application.
   3. The condenser coil must be mechanically protected from physical damage by painted galvanized steel louvers covering the full area of the coil.
   4. Access to condenser coils, condenser fans, compressors, and electrical and controls components must be through hinged access doors with quarter turn, zinc cast, lockable handles.
   5. Exterior paint finish must be capable of withstanding at least 2,500 hours, with no visible corrosive effects, when tested in a salt spray and fog atmosphere in accordance with ASTM B 117-95 test procedure.
   6. Unit must include lifting lugs plus a fork liftable base.

E. Refrigeration System:
   1. Unit must be provided with two circuits and no compressors.
   2. Each refrigeration circuit must be equipped with service valves for liquid and discharge connections. Liquid line filter driers must be factory provided and installed.

F. Condenser:
   1. Condenser fans must be vertical discharge, axial flow, direct drive fans.
   2. Fan motor must be weather protected, direct drive, and open drip proof with inherent overload protection.
   3. Variable frequency drive controlled variable speed condenser fans must be provided for head pressure control and allow operation down to 35°F.Fan motor must be weather protected, single phase, direct drive, and open, air over (OPAO) with thermal overload protection.
   4. Coils must be designed for use with R-410A refrigerant and constructed of copper tubes with aluminum fins mechanically bonded to the tubes and aluminum end casings. Fin design must be sine wave rippled.
   5. Coils must be designed for a minimum of 10°F of refrigerant sub-cooling.
   6. Coils must be hydrogen or helium leak tested.

G. Electrical:
   1. Unit must be provided with a standard power block for connecting power to the unit.
   2. Control circuit transformer and wiring must provide 24 VAC control voltage from the line voltage provided to the unit.
   3. Units must be provided with factory installed and factory wired 115V, 15 amp GFI outlet with outlet disconnect switch in the unit control panel.
   4. Unit must have a 5kAIC SCCR.

H. Controls:
   1. Intended to be paired with a remote matching compressor section in the air handling unit controls. The signal from the control boards will need to be wired from the compressor section to the head pressure control terminal in condenser.

2.2 SOURCE QUALITY CONTROL

A. Verification of Performance: Rate condenser units according to ARI 210/240, ARI 340/360, or ARI 365.

   1. Energy Efficiency: Equal to or greater than prescribed by ASHRAE/IESNA 90.1-2010, "Energy Efficient Design of New Buildings except Low-Rise Residential Buildings."

B. Testing Requirements: Factory test sound-power-level ratings according to ARI 270.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Install unit level and plumb, firmly anchored in locations indicated; maintain manufacturer's recommended clearances.

B. Install condenser on equipment rails. Coordinate steel dunnage location to maintain manufacturers recommended and code required clearances for service and maintenance.

C. Vibration Isolation: Mount condenser on neoprene vibration isolation pads with a minimum deflection of 0.25 inches. Vibration isolation devices and installation requirements are specified in Section 230548.13 "Vibration Controls for HVAC".

D. Provide refrigerant piping from matching air handing compressor section and air handling unit the condenser; maintain required access to unit. Install furnished field-mounted accessories. Refrigerant piping and specialties are specified in Section 232300 "Refrigerant Piping."

3.3 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:

1. Perform electrical test and visual and mechanical inspection.
2. Leak Test: After installation, charge systems with refrigerant and oil and test for leaks. Repair leaks, replace lost refrigerant and oil, and retest until no leaks exist.
3. Operational Test: After electrical circuitry has been energized, start units to confirm proper operation, product capability, and compliance with requirements.
4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
5. Verify proper airflow over coils.

B. Verify that vibration isolation and flexible connections properly dampen vibration transmission to structure.

C. Remove and replace malfunctioning condenser and retest as specified above.

END OF SECTION 23 63 13

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 23 74 33 – DEDICATED OUTDOOR-AIR UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section Includes:
   1. Dedicated outdoor-air handling unit.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each unit indicated.

   1. Unit dimensions, shipping and operating weight.
   2. Cabinet material, metal thickness, finishes, insulation, and accessories.
   3. Fans:

      a. Certified fan-performance curves with system operating conditions indicated.
      b. Certified fan-sound power ratings.
      c. Fan construction and accessories.
      d. Motor ratings, electrical characteristics, and motor accessories.

   4. Certified coil-performance ratings with system operating conditions indicated.
   5. Dampers, including housings, linkages, and operators.
   6. Filters with performance characteristics.
   7. Wiring diagram must be provided with details for both power and control systems and differentiate between factory installed and field installed wiring.
   8. Installation, Operation and Maintenance manual with startup requirements must be provided.

B. Source quality-control reports.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Unit must be certified in accordance with UL Standard 1995/CSA C22.2 No. 236, Safety Standard for Heating and Cooling Equipment.

C. Unit and refrigeration system must comply with ASHRAE 15, Safety Standard for Mechanical Refrigeration.

D. Unit Energy Efficiency Ratio (EER) must be equal to or greater that prescribed by ASHRAE 90.1, Energy Efficient Design of New Buildings except Low-Rise Residential Buildings.

E. Unit must be safety certified by ETL and ETL US listed. Unit nameplate must include the ETL/ETL Canada label.

1.6 SPECIAL REQUIREMENTS

A. The condenser must be same manufacturer matched to perform as dedicated outdoor air unit. Refer to specification Section 23 63 13 –"Air Cooled Refrigerant Condenser".

1.7 DELIVERY AND STORAGE

A. Unit must be plastic shrink-wrapped prior to shipment to prevent damage during transport and thereafter while in storage awaiting installation.

B. Follow Installation, Operation and Maintenance manual instructions for rigging, moving, and unloading the unit at its final location.

C. Unit must be handled carefully to avoid damage to components, enclosures, and finish.

D. Unit must be stored in a clean, dry place protected from weather and construction traffic in accordance with Installation, Operation and Maintenance manual instructions.

1.8 WARRANTY

A. The manufacturer must provide warranty for a period of 12 months from the date of substantial completion. The warranty must cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer's written instructions for installation, operation and maintenance have been followed. Warranty excludes parts associated with routine maintenance and refrigerant.

B. Compressors must carry a five-year warranty from date of original equipment shipment from the factory.

1.9 DELIVERY STORAGE AND HANDLING

A. Unit must be wrapped in plastic prior to shipment to prevent damage during transport and thereafter while in storage awaiting installation.

B. Follow Installation, Operation and Maintenance manual instructions for rigging, moving, and unloading the unit at its final location.

C. Unit must be handled carefully to avoid damage to components, enclosures and finish.

D. Unit must be stored in a clean, dry place protected from construction traffic in accordance with the Installation, Operation and Maintenance manual.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Product: Subject to compliance with requirements, provide product indicated on the drawings by AAON or comparable product by one of the following:
   1. Trane.
   2. Carrier.
   3. Daikin McQuay.
   4. Or approved equal.

B. Compatible product must meet the following key features:
   1. Both the condenser and the air handler must be matched in performance and from single manufacturer.
   2. Both the condenser and the air handler must fit dimensionally and meet access and service requirements in the allocated space as outlined in the drwaings.
   3. Both the condenser and the air handler must meet or better the noise levels scheduled on plans.

2.2 GENERAL DESCRIPTION

A. Indoor air handling units must refrigeration section to include compressors, valves, refrigeration and air handling section to include filters, supply fans, DX evaporator coil, hot gas reheat coil, electric heating coil and unit controls.

B. R-410A refrigerant.

C. The unit must have a draw-through supply fan configuration. ECM driven direct drive backward curved plenum supply fans.

D. Unit must be factory assembled and tested including leak testing of the DX coil, and run testing of the supply fans and factory wired electrical system. Run test report must be supplied with the unit.

E. Unit must have decals and tags to indicate lifting and rigging, service areas and caution areas for safety and to assist service personnel.

F. Unit components must be labeled, including pipe stub outs, refrigeration system components and electrical and controls components.

G. Installation, Operation and Maintenance manual must be supplied within the unit.

H. Laminated color-coded wiring diagram must match factory installed wiring and must be affixed to the interior of the control compartment's hinged access door.

I. Unit nameplate must be provided in two locations on the unit, affixed to the exterior of the unit and affixed to the interior of the control compartment's hinged access door.

2.3 CONSTRUCTION

A. All cabinet walls, access doors, and roof must be fabricated of double wall, impact resistant, rigid polyurethane foam panels.

B. Unit insulation must have a minimum thermal resistance R-value of 6.25. Foam insulation must have a minimum density of 2 pounds/cubic foot and must be tested in accordance with ASTM D1929-11 for a minimum flash ignition temperature of 610°F.

C. Unit construction must be double wall with G90 galvanized steel on both sides and a thermal break. Double wall construction with a thermal break prevents moisture accumulation on the insulation, provides a cleanable interior, prevents heat transfer through the panel, and prevents exterior condensation on the panel.

D. Unit must be designed to reduce air leakage and infiltration through the cabinet. Sealing must be included between panels and between access doors and openings to reduce air leakage. Piping and electrical conduit through cabinet panels must include sealing to reduce air leakage.

E. Access to filters, cooling coil, hot gas reheat coil, electric heating coil, supply fans, and electrical and controls components must be through hinged access doors.

F. Access doors must be flush mounted to cabinetry, with stainless steel removable pin hinges and zinc cast lockable handles. Coil access door and supply fan access door must include quarter-turn lockable handles. Supply fan access door must include removable pin hinges.

G. Units with a cooling coil must include sloped 304 stainless steel drain pan. Drain pan connection must be on the right hand side of unit.

H. Cooling coil must be mechanically supported above the drain pan by multiple supports that allow drain pan cleaning and coil removal.

2.4 ELECTRICAL

A. Unit must be provided with an integrated control panel with separate low voltage control wiring with conduit and high voltage power wiring with conduit between the control panel and the unit. Control panel must be field mounted.

B. Unit must be provided with standard power block for connecting power to the unit.

C. Unit must include a factory installed 24V control circuit transformer.

D. Unit must have a 5kAIC SCCR.

E. Unit must be provided with blower auxiliary contacts on the low voltage terminal block which close when the supply fans are energized.

F. Unit must be provided with remote stop/start terminals which require contact closure for unit operation. When these contacts are open the low-voltage circuit is broken and the unit will not operate.

G. Unit configured with VCC-X Controls. Sensors will be provided matching the control style (VAV, CAV, MUA)

H. Compressorized unit with Reheat and Remote Condenser. RSMD output for condenser fan speed control will be wired to a terminal block for controlling remote condenser fans.

2.5 SUPPLY FAN

A. Unit must include direct drive, unhoused, backward curved, plenum supply fans.

B. Blower and motor assembly must be dynamically balanced.

C. Motor must be a high efficiency electronically commutated motor (ECM).

D. Blower and motor assembly must be mounted on rubber isolators.

E. ECM driven supply fan speed must be controlled with the factory installed AAON controller.

F. Access to supply fan must be through removable bolted access panels on the top and bottom of the unit.

G. Removable access panels and supply duct flanges must be interchangeable.

2.6 COOLING COIL

A. Coil must be designed for use with R-410A refrigerant and constructed of copper tubes with aluminum fins mechanically bonded to the tubes and aluminum end casings. Fin design must be sine wave rippled.

B. Coil must have two circuits and interlaced circuitry;

C. Coil must be 6 row high capacity and 12 fins per inch.

D. Coil must be hydrogen or helium leak tested.

E. Coil must be furnished with factory installed thermostatic expansion valves. The sensing bulbs must be field installed on the suction line immediately outside the cabinet.

F. Coil must have right hand external piping connections. Liquid and suction connections must be sweat connection. Coil connections must be labeled, extend beyond the unit casing, and be factory sealed on both the interior and exterior of the unit casing, to minimize air leakage.

G. Drain pan must be provided with overflow switch which shuts down the cooling circuits.

2.7 REGRIGERATION SYSTEM

A. Air handling unit and matching compressor section must be capable of operation with matching air-cooled condenser as an R-410A split system air conditioner.

B. Unit must include a variable capacity scroll compressor on the lead refrigeration circuit which must be capable of modulation from 10-100% of its capacity.

C. Each compressor must be furnished with a crankcase heater.

D. Compressors must be mounted in an isolated service compartment which can be accessed without affecting unit operation. Lockable hinged compressor access doors must be fabricated of double wall, rigid polyurethane foam insulated panels to prevent the transmission of noise outside the cabinet.

E. Compressors must be isolated from the base pan with the compressor manufacturer's recommended rubber vibration isolators, to reduce any transmission of noise from the compressors into the building area.

F. Each refrigeration circuit must be equipped with automatic reset low pressure and manual reset high pressure refrigerant safety controls, Schrader type service fittings on both the high pressure and low-pressure sides, and service valves for liquid and suction connections. Liquid line filter driers must be factory provided. Finished field installed refrigerant circuits must include the low side cooling components, refrigerant, thermal expansion valve, liquid line, insulated hot gas line and insulated suction line.

G. Unit must be equipped with thermostatic expansion valve type refrigerant flow control.

H. All water source piping and components will be omitted. A two (2) circuit cooling only DX system with remote condenser will be provided.

I. Modulating hot gas reheat (single circuit coil) must be provided on the lead refrigeration circuit. Refrigeration circuit must be provided with hot gas reheat coil, modulating valves, receiver tank, electronic controller, supply air temperature sensor and a dehumidification control signal terminal which allow the unit to have a dehumidification mode of operation, which includes supply air temperature control to prevent supply air temperature swings and overcooling of the space.

J. Each of the two (2) refrigeration circuits must be equipped with liquid line sight glass.

K. [AHU-1] Each refrigeration circuit (2 circuits) must be equipped with suction and discharge compressor isolation valves and sensor on each circuit.

L. Hot gas and liquid line connections will stub out for field piping.

M. The unit must be capable of stable cooling operation to a minimum of 55°F outdoor temperature.

N. All refrigeration circuits must be provided with external hot gas bypass to protect against evaporator frosting and to prevent excessive compressor cycling.

O. Units must be provided with a suction pressure transducer on each refrigeration circuit.

2.8 ELECTRIC HEATING

A. Electric Heating
1. Unit must include an electric heater consisting of electric heating coils, fuses and a high temperature limit switch, with capacities as shown on the plans.
2. Electric heating coils must be located in the reheat position downstream of the cooling coil.
3. Electric heat must have fully modulating capacity controlled by an SCR (Silicon Controlled Rectifier). A 0-10 VDC heating control signal must be field provided to control the amount of heating.

2.9 FILTERS

A. Unit must include 4-inch thick, pleated panel filters with an ASHRAE efficiency of MERV-7 pre-filter and final filter of MERV-15, in a pre-filter box upstream of the cooling coil.

B. Unit must include a clogged filter switch that senses the pressure drop across the unit filter bank.

C. Unit must include factory installed magnehelic gauge measuring the pressure drop across the filter rack.

2.10 CONTROLS

A. Unit must be provided with an internal control panel with separated low and high voltage control wiring.

B. Access to internal control panel must be through an access door with removable pin hinges and lockable quarter turn handles.

C. Factory Installed and Factory Provided Controller
1. Unit controller must be capable of controlling all features and options of the unit. Controller must be factory installed in the unit controls compartment and factory tested.
2. Controller must be capable of standalone operation with unit configuration, setpoint adjustment, sensor status viewing, unit alarm viewing, and occupancy scheduling available without dependence on a building management system.
3. Controller must have an onboard clock and calendar functions that allow for occupancy scheduling.
4. Controller must include non-volatile memory to retain all programmed values without the use of a battery, in the event of a power failure.
5. Make Up Air Controller
   a. Supply air must modulate based on 0-10V signal (duct mounted static pressure sensor)
   b. Unit must modulate cooling with varying airflow to meet ventilation outside air loads. Cooling capacity must modulate based on supply air temperature.

c. Hot gas bypass must be required on the lead refrigeration circuits of systems without variable capacity compressors.
d. Supply air temperature sensor and outside air temperature sensor must be furnished with the unit for field installation.
e. An outside air humidity sensor must be furnished with the unit for field installation. Suction pressure sensor must be factory installed. Supply air temperature and space humidity setpoints, for the dehumidification mode of operation, must be adjustable.

6. Unit configuration, setpoint adjustment, sensor status viewing, unit alarm viewing, and occupancy scheduling must be accomplished with connection to interface module with LCD screen and input keypad, interface module with touch screen, or with connection to PC with free configuration software. Controller must be capable of connection with other factory installed and factory provided unit controllers with individual unit configuration, setpoint adjustment, sensor status viewing, and occupancy scheduling available from a single unit. Connection between unit controllers must be with a modular cable. Controller must be capable of communicating and integrating with a LonWorks or BACnet network.

D. Basic Unit Control Features:
1. Control-voltage transformer.
2. Wall-mounted thermostat or sensor with the following features:
a. Heat-cool-off switch.
b. Fan on-auto switch.
c. Fan-speed switch.
d. Automatic changeover.
e. Adjustable deadband.
f. Concealed set point.
g. Concealed indication.
h. Degree F indication.
i. Data entry and access port to input temperature set points, occupied and unoccupied periods, and output room temperature, supply-air temperature, operating mode, and status.
j. Remote Wall Mounted Annunciator Panel for Each Unit:
1) Lights to indicate power on, cooling, heating, fan running, filter dirty, and unit alarm or failure.
2) Direct Digital Controller's programmable timer and interface with HVAC instrumentation and control system.
3) Digital display of outdoor-air temperature, supply-air temperature, return-air temperature, economizer damper position, indoor-air quality, and control parameters.

E. Direct Digital Controller Sequence Controller – Sequence of Operation

1. Safety Control Operation:
a. Unit must be provided with a low voltage safety shutdown terminal block for field installation of a smoke detector which shuts off the unit's control circuit.

2. Unit controls must sequence heating, economizer, cooling, dehumidification and reheat in sequence and must be sequenced as follows:

a. Sequence
   1) Heating mode for outdoor temperature below 55 deg F - supply air temperature set to 70 deg F.
   2) Economizer cooling from 55 deg F to 70 deg F – supply air enthalpy not exceeding 23.5 Btu/lb.
   3) Activate dehumidification cycle and hot gas reheat for outside air enthalpy exceeding 23.5 Btu/lb to maintain supply air dewpoint of 55 deg F, supply air temperature of 65 deg F.
   4) Cooling for outdoor air temperature exceeding 70 deg F, coil discharge air temperature of 55 deg F.

b. Scheduled Operation: Occupied and unoccupied periods on 365-day clock with a minimum of four programmable periods per day.

c. Unoccupied Period:
   1) System off.
   2) Override Operation: Two hours.

d. Supply Fan Operation:
   1) Occupied Periods: Run fan continuously.
   2) Unoccupied Periods: System off.

e. Occupied Cycles:
   1) The supply fan is commanded ON to run continuously subject to all safeties.
   2) The unit will start and operate in cooling, de-humidification or heating mode based on outside air temperature to reach a supply air set-point temperature and humidity.

f. Refrigerant Circuit Operation:
   1) Occupied Periods:
      a) Cooling Cycle: Unit when indexed for cooling must energize condenser unit CU-1. The variable speed compressors must modulate output meet cooling load.
      b) De-Humidification Cycle: Unit must cool and reheat via hot gas reheat coil to meet maximum dewpoint temperature of 55 deg F when outdoor air enthalpy exceeds 23.5 Btu/lb
   2) Remote condenser unit CU-1 must be enabled via unit controller and operate under control of factory provided controls.
   3) The ECM driven condenser fan(s) must modulate to maintain hot-gas pressure.
   4) Unoccupied Periods: Condensing unit off.

g. Heating Coil Operation:
   1) Occupied Periods: Modulate via SCR control heating coil output to maintain heating supply air temperature of 70 deg F.
   2) Unoccupied Periods: System Off.

h. Economizer Outdoor-Air Damper Operation:
   1) Occupied Periods: Two-position damper open to maximum 100 percent of the fan capacity to comply with ASHRAE Cycle II. Controller must permit air-side economizer operation when outdoor air is less than 55 deg F Use outdoor-air enthalpy to lock out cooling.
   2) Unoccupied Periods: Close outdoor-air damper.
   3) Outdoor-Airflow Monitor: Accuracy maximum plus or minus 5 percent within 15 and 100 percent of total outdoor air. Monitor microprocessor must adjust for temperature, and output must range from 2- to 10-V dc or 4 to 20 mA.

i. Demand Control Ventilation
   1) Room level CO2 sensor must modulate associated conditioned outdoor air supply motorized damper to maintain CO2 setpoint of 800 ppm (adjustable).
   2) Field installed duct mounted static pressure must modulate supply fan in response to changes in supply duct static via 0-10V signal to supply fan variable frequency drive from BMS.

j. Compliance with ASHRAE 90.1- 2016
   1) Controls must incorporate a dead band of at least 5°F within which supply of heating and cooling energy is shut-off or reduced to a minimum.
   2) Incorporate programming to prevent heating set point from exceeding the cooling set point minus applicable proportional band.

k. Provide BACnet compatible interface for central HVAC control workstation for the following:
   1) Adjusting set points.
   2) Monitoring supply fan start, stop, and operation.
   3) Inquiring data to include outdoor-air damper position, outdoor air flowrate, supply- and room-air temperature and humidity, room and return air CO2.
   4) Monitoring occupied and unoccupied operations.

2.11 SOURCE QUALITY CONTROL

A. Fan Sound-Power Level Ratings: Comply with AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Fans must bear AMCA-certified sound ratings seal.

B. Fan Performance Rating: Factory test fan performance for airflow, pressure, power, air density, rotation speed, and efficiency. Rate performance according to AMCA 210, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating."

C. Refrigerant Coils: Factory tested to 450 psig according to ARI 410 and ASHRAE 33.

D. Submit factory acceptance testing report.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Installation, Operation and Maintenance manual must be supplied with the unit.

B. Installing contractor must install unit, including field installed components, in accordance with Installation, Operation and Maintenance manual instructions.

C. Equipment Mounting: Install air-handling units on concrete without vibration isolation devices. Secure units to anchor bolts installed in concrete bases.

D. Arrange installation of units to provide access space around air-handling units for service and maintenance.

E. Do not operate fan system until filters (temporary or permanent) are in place. Replace temporary filters used during construction and testing, with new, clean filters.

F. Install filter-gage, static-pressure taps upstream and downstream of filters. Mount filter gages on outside of filter housing or filter plenum in accessible position. Provide filter gages on filter banks, installed with separate static-pressure taps upstream and downstream of filters.

G. Comply with requirements for piping specified in other Section 23 23 00 – “Refrigerant Piping”. Drawings indicate general arrangement of piping, fittings, and specialties.

H. Install piping adjacent to air-handling unit to allow service and maintenance.

I. Connect condensate drain pans using NPS 1-1/4, ASTM B 88, Type M copper tubing. Extend to nearest equipment or floor drain. Construct deep trap at connection to drain pan and install cleanouts at changes in direction.

J. Refrigerant Piping: Comply with applicable requirements in Section 23 23 00 "Refrigerant Piping." Install shutoff valve and union or flange at each supply and return connection.

K. Connect duct to air-handling units with flexible connections. Comply with requirements in Section 23 33 00 "Air Duct Accessories."

L. Start up and maintenance requirements must be complied with to ensure safe and correct operation of the unit.

END OF SECTION 23 74 33

THIS PAGE INTENTIONALLY LEFT BLANK.

SECTION 23 81 29 - VARIABLE REFRIGERANT FLOW HVAC SYSTEMS

PART 1 - GENERAL

1.1 RELATED DESCRIPTION

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section includes multi-split variable refrigerant volume heat recovery heat pump system.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. The equipment supplier must submit as part of the equipment data package condensing unit data sheets. Data sheets to include the following:

1. Capacities at project design conditions: Cooling (Btu/h)
2. Cooling Input Power – ducted, ductless and mixed (kW)
3. Part Load IEER – ducted, ductless and mixed
4. Full Load EER – ducted, ductless and mixed
5. Capacities at project design conditions: Heating (Btu/h)
6. Heating Input Power – ducted, ductless and mixed (kW)
7. Full Load COP@47F – ducted, ductless and mixed
8. Full Load COP@17F – ducted, ductless and mixed

B. The submitted capacity and efficiency performance must meet or exceed the listed performance on the schedule at the designed space conditions including de-rate factors for defrost if applicable and refrigerant piping losses.

1. Operating Temperature Range:
   a. Cooling
   b. Heating

2. Power Supply:
   a. Maximum Circuit Amps (MCA)
   b. Maximum Overcurrent Protection Amps (MOP)
   c. Maximum Starting Current (MSC)
   d. Condenser Fan Motor

3. Refrigerant:
   a. Refrigerant Type/Charge
   b. Control

4. Unit Data:

a. Max. Number of Indoor Units
b. Octave Band Sound Power Level. (dBA)
c. Weight (lbs)
d. Dimensions

C. The equipment supplier must submit indoor unit data sheets. Data sheets to include the following:

1. Capacities:
   a. Cooling (Btu/h)
   b. Heating (Btu/h)
2. Air Flow (CFM)
3. External Static Pressure (ESP)
4. Octave Band Sound Power Data
5. Electrical Data (MCA, MOP, MSC)
6. Weight (lbs):
7. Dimensions:

D. The equipment supplier must guarantee the performance of their system and all published data submitted. Performance must be based on the design criteria below.

1. Room Temperature (Cooling): 72°F
2. Room Temperature (Heating): 75°F
3. Ambient Temperature (Summer): 92°F DB / 74°F WB
4. Ambient Temperature (Winter): 5°F

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. The units must be tested by a Nationally Recognized Testing Laboratory (NRTL), in accordance with ANSI/UL 1995 – Heating and Cooling Equipment and bear the Listed Mark.

C. All wiring must be in accordance with the National Electric Code (NEC).

1.6 SYSTEM DESCRIPTION

A. All system components, controls and specialty fittings must be from a single manufacturer for single point of responsibility and equipment warranty.

B. The variable capacity, heat recovery heat pump air conditioning system must be a Variable Refrigerant Volume/ Flow (VRV/ VRF) Series) heat recovery type heat pump split system as specified, branch selector boxes, manufacturer’s specialty piping joints and headers, multi-pipe refrigeration distribution system using PID control and matching condenser unit. The condenser must be a direct expansion (DX), air-cooled heat recovery, multi-zone air-conditioning system with variable speed inverter driven compressors using R-410A refrigerant. The condensing unit may connect an indoor evaporator capacity up to 200% of the condensing unit capacity. All zones are capable of operating separately with individual temperature control.

C. The condensing unit must be interconnected to indoor unit models must range in capacity from 7,500 Btu/h to 96,000 Btu/h in accordance with manufacturer’s engineering data book detailing each available indoor unit. The indoor units must be connected to the condensing unit utilizing

manufacturer's specialty piping joints and headers to ensure correct refrigerant flow and balancing. T style joints are not acceptable for variable refrigerant flow system.

D. Operation of the system must permit either individual cooling or heating of each indoor unit simultaneously or all of the indoor units associated with each branch of the cool/heat branch selector box. Each indoor unit or group of indoor units must be able to provide set temperature independently via a local remote controller.

E. Branch selector boxes must be located as shown on the drawing. The branch selector boxes must have the capacity to control up to 290 MBH (cooling) downstream of the branch selector box. Each branch of the branch selector box must consist of three electronic expansion valves, refrigerant control piping and electronics to facilitate communications between the box and main processor and between the box and indoor units. The branch selector box must control the operational mode of the subordinate indoor units. The use of three EEV's ensures continuous heating during defrost (multiple condenser systems), no heating impact during changeover and reduced sound levels. The use of solenoid valves for changeover and pressure equalization is not acceptable due to refrigerant noise.

1.7 DELIVERY, STORAGE AND HANDLING

A. Unit must be stored and handled according to the manufacturer's recommendations.

1.8 WARRANTY

A. The manufacturer warrants City of New York of the products specified above that under normal use and maintenance for comfort cooling and conditioning applications such products will be free from defects in material or workmanship. This warranty applies to compressor and all parts only.

B. The warranty must be a minimum of seven years from the date of substantial completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide system by Daikin or comparable product by one of the following:
1. Mitsubishi.
2. Toshiba.
3. LG inc.
4. Or approved equal.

2.2 PERFORMANCE

A. Performance Conditions:
1. Cooling: indoor temp. of 80°F DB, 67°F WB and outdoor temp. of 95°F DB.
2. Heating: indoor temp. of 70°F DB and outdoor temp. of 47°F DB, 43°F WB.
3. Equivalent piping length: 25ft
4. The system IEER, EER and COP values for systems sized 300MBH and smaller are certified to AHRI Std. 1230.

B. Operating Range
1. The operating range in cooling will be 23°F DB ~ 122°F DB.

2. The operating range for the heating will be 0°F DB – 77°F DB / -4°F WB – 60°F WB.
3. Cooling mode indoor room temperature range will be 57°F-77°F WB.
4. Heating mode indoor room temperature range will be 59°F-80°F DB.

2.3 REFRIGERANT PIPING

A. The system must be capable of refrigerant piping up to 540 actual feet or 620 equivalent feet from the condensing unit to the furthest indoor unit, a total combined liquid line length of 3,280 feet of piping between the condensing and indoor units with 295 feet maximum vertical difference, without any oil traps.

B. Specialty fittings and piping joints and headers must be used to ensure proper refrigerant balance and flow for optimum system capacity and performance. T style joints are not be acceptable as this will negatively impact proper refrigerant balance and flow for optimum system capacity and performance.

2.4 CONDENSING UNIT

A. General: The condensing unit must be designed specifically for use with VRV/VRF components.
1. The condensing unit must be pre-wired with all necessary electronic and refrigerant controls. The refrigeration circuit of the condensing unit must consist of inverter scroll compressors, motors, fans, condenser coil, electronic expansion valves, solenoid valves, 4-way valve, distribution headers, capillaries, filters, shut off valves, oil separators, service ports, liquid receiver and suction accumulator.
2. High/low pressure gas line, liquid and suction lines must be individually insulated between the condensing and indoor units.
3. The condensing unit can be wired and piped with access from the left, right, rear or bottom.
4. The connection ratio of indoor units to condensing unit must be permitted up to 200%.
5. Each condensing system must be able to support the connection of up to 64 indoor units dependent on the model of the condensing unit.
6. The sound pressure level standard must be that value as listed in the manufacturer's engineering manual for the specified models at 3 feet from the front of the unit. The condensing unit must be capable of operating automatically at further reduced noise during night time or via an external input.
7. The system will automatically restart operation after a power failure and will not cause any settings to be lost, thus eliminating the need for reprogramming.
8. The unit must incorporate an auto-charging feature. Manual changing should be supported with a minimum of 2 hours of system operation data to ensure correct operation.
9. The condensing unit must be modular in design and should allow for side-by-side installation with minimum spacing.
10. The following safety devices must be included on the condensing unit; high pressure sensor and switch, low pressure sensor, control circuit fuses, crankcase heaters, fusible plug, overload relay, inverter overload protector, thermal protectors for compressor and fan motors, over current protection for the inverter and anti-recycling timers.
11. To ensure the liquid refrigerant does not flash when supplying to the various indoor units, the circuit must be provided with a sub-cooling feature.
12. Oil recovery cycle must be automatic. Each system must maintain continuous heating during oil return operation.

13. The condensing unit must be capable of heating operation at -13°F wet bulb ambient temperature without additional low ambient controls or an auxiliary heat source.
14. The multiple condenser VRV/VRF systems must continue to provide heat to the indoor units in heating operation while in the defrost mode.

B. Unit Cabinet:
1. The condensing unit must be completely weatherproof and corrosion resistant. The unit must be constructed from rust-proofed galvanized steel panels coated with a baked enamel finish.

C. Fan:
1. The condensing unit must consist of one or more propeller type, direct-drive fan motors that have multiple speed operation via a DC (digitally commutating) inverter.
2. The condensing unit fan motor must have multiple speed operation of the DC (digitally commutating) inverter type, and be of high external static pressure and must be factory set as standard at 0.12 in. WG. A field setting switch to a maximum 0.32 in. WG pressure is available to accommodate field applied duct for indoor mounting of condensing units.
3. The fan must be a vertical discharge configuration with a nominal airflow maximum range of 5,550 CFM to 24,690 CFM dependent on model specified.
4. Nominal sound pressure levels must not exceed 64 dBA at 3.3 feet from the unit.
5. The fan motor must have inherent protection and permanently lubricated bearings and be mounted.
6. The fan motor must be provided with a fan guard to prevent contact with moving parts.
7. Night setback control of the fan motor for low noise operation by way of automatically limiting the maximum speed must be a standard feature. Operation sound level must be selectable from 3 steps of sound pressure levels at 55 dBA, 50 dBA and 45 dBa.

D. Condenser Coil:
1. The condenser coil must be manufactured from copper tubes expanded into aluminum fins to form a mechanical bond.
2. The heat exchanger coil must be of a waffle louver fin and rifled bore tube design to ensure high efficiency performance.
3. The heat exchanger on the condensing units must be manufactured from Hi-X seamless copper tube with N-shape internal grooves mechanically bonded on to aluminum fins to an e-Pass Design.
4. The fins must be coated with an anti-corrosion hydrophilic blue coating as standard from factory with a salt spray test rating of 1000hr per ASTM B117 test standards.
5. The outdoor coil must have three-circuit heat exchanger design eliminating the need for a drain pan heater. The lower part of the coil must be used for inverter cooling and be on or off during operation enhancing the defrost operation.
6. Manufacturer must provide a drain pan heater to enable adequate defrosting of the unit in defrost operation.
7. The condensing unit must be factory equipped with condenser coil guards on all sides.

E. Compressor:
1. The inverter Flash Vapor injection scroll compressors must be variable speed (PVM inverter) controlled which is capable of changing the speed to follow the variations in total cooling and heating load as determined by the suction gas pressure as measured in the condensing unit.
   a. In addition, samplings of evaporator and condenser temperatures must be made so that the high/low pressures detected are read every 20 seconds and calculated.

With each reading, the compressor capacity (INV frequency) must be controlled to eliminate deviation from target value.

1) Non –inverter-driven compressors, which may cause starting motor current to exceed the nominal motor current (RLA) and require larger wire sizing, are not allowed.

2. The inverter driven compressor in each condensing unit must be of highly efficient reluctance DC (digitally commutating), hermetically sealed scroll “K-type”
3. Neodymium magnets must be adopted in the rotor construction to yield a higher torque and efficiency in the compressor instead of the normal ferrite magnet type.
   a. At complete stop of the compressor, the neodymium magnets will position the rotor into the optimum position for a low torque start.
4. The capacity control range must be as low as 3% to 100%.
5. The compressor’s motor must have a cooling system using discharge gas, to avoid sudden changes in temperature resulting in significant stresses on winding and bearings.
6. Each compressor must be equipped with a crankcase heater, high pressure safety switch, and internal thermal overload protector.
7. Oil separators must be standard with the equipment together with an intelligent oil management system.
8. The compressor must be mounted on vibration dampening rubber grommets to minimize the transmission of vibration, eliminating the standard need for external spring isolation.
9. In the event of compressor failure, the remaining compressors must continue to operate and provide heating or cooling as required at a proportionally reduced capacity. The microprocessor and associated controls must be designed to specifically address this condition.
10. In the case of multiple condenser modules, combined operation hours of the compressors must be balanced by means of the Duty Cycling Function, ensuring sequential starting of each module at each start/stop cycle, completion of oil return, completion of defrost or every 8 hours.

F. Sound Data: Octave band sound data must not exceed those scheduled on plans.

G. Electrical:
1. The power supply to the condensing unit must be 208-230 volts, operating voltage range of 187V~253 V, 3 phase, 60 hertz +/- 10%.
2. The control voltage between the indoor and condensing unit must be 16VDC non-shielded, stranded 2 conductor cable.
3. The control wiring must be a two-wire multiplex transmission system, making it possible to connect multiple indoor units to one condensing unit with one 2-cable wire, thus simplifying the wiring installation.
4. The control wiring lengths must be as shown below.

	Condenser to Indoor Unit	Condenser to Central Controller	Indoor Unit to Remote Control
Control Wiring Length	6,665 ft	3,330 ft	1,665 ft
Wire Type	16/18 AWG, 2 wire, non-polarity, non-shielded, stranded		

2.5 BRANCH SELECTOR BOX

A. General: The branch selector boxes are designed specifically for use with VRV/VRF heat recovery system components.
   1. These selector boxes must be factory assembled, wired, and piped.
   2. These branch controllers must be run tested at the factory.
   3. These selector boxes must be mounted indoors.
   4. When simultaneously heating and cooling, the units in heating mode must energize their sub-cooling electronic expansion valve.

B. Unit Cabinet
   1. These units must have a galvanized steel plate casing.
   2. Each cabinet must house 3 electronic expansion valves for refrigerant control per branch.
   3. The cabinet must contain one subcooling heat exchanger per branch.
   4. The unit must have sound absorption thermal insulation material made of flame and heat resistant foamed polyethylene.
   5. Nominal sound pressure levels must be measured and published on the submittals by the manufacturer. These sound levels must not exceed 34 dBA.

C. Refrigerant Valves
   1. The unit must be furnished with 3 electronic expansion valves per branch to control the direction of refrigerant flow. The use of solenoid valves for changeover and pressure equalization are not be acceptable due to refrigerant noise.
   2. The refrigerant connections must be of the brazed type.
   3. In multi-port units, each port must have its own electronic expansion valves. If common expansion/solenoid valves are used, redundancy must be provided.
   4. Each circuit must have at least one branch selector box of appropriate caapcity.
   5. Multiple indoor units may be connected to a branch selector box with the use of a manufacturer’s specialty joint provided they are within the capacity range of the branch selector.

D. Condensate Removal
   1. The unit must not require auxiliary provisions for condensate removal. A safety device or secondary drain pan must be installed to comply with 2022 NYC Mechanical Code, Section 307.

E. Electrical
   1. The unit electrical power must be 208/230 volts, 1 phase, 60 hertz.
   2. The unit must be capable of operation within the limits of 187 volts to 255 volts.
   3. The minimum circuit amps (MCA) must be 0.1 and the maximum overcurrent protection amps (MOP) must be 15.
   4. The control voltage between the indoor and condensing unit must be 16VDC non-shielded 2 conductor cable.

2.6 CONCEALED CEILING DUCTED UNIT (Med. Static)

A. General: indoor unit must be a built-in ceiling concealed fan coil unit, operable with refrigerant R-410A, equipped with an electronic expansion valve, for installation into the ceiling cavity. It is constructed of a galvanized steel casing. It must be horizontal discharge air with horizontal return air configuration. Computerized PID control must be used to control superheat to deliver a comfortable room temperature condition. The indoor units sound pressure must be 48 dB(A) at low speed measured 5 feet below the ducted unit.

B. Performance: Each unit's performance is based on nominal operating conditions as scheduled on plans

C. Indoor Unit:
1. The indoor unit must be completely factory assembled and tested. Included in the unit is factory wiring, piping, electronic proportional expansion valve, control circuit board, fan motor thermal protector, flare connections, self-diagnostics, auto-restart function, 3-minute fused time delay, and test run switch. The unit must have an adjustable external static pressure switch.
2. Indoor unit and refrigerant pipes will be charged with dehydrated air prior to shipment from the factory.
3. Both refrigerant lines must be insulated from the outdoor unit.
4. The indoor units must be equipped with a return air thermistor.
5. The indoor unit will be separately powered with 208~230V/1-phase/60Hz.
6. The voltage range will be 253 volts maximum and 187 volts minimum.

D. Unit Cabinet:
1. The cabinet must be located into the ceiling and ducted to the supply and return openings.
2. The cabinet must be constructed with sound absorbing foamed polystyrene and polyethylene insulation.

E. Fan:
1. The fan must be direct-drive Sirocco type fan, statically and dynamically balanced impeller with high and low fan speeds available.
2. The fan motor must operate on 208/230 volts, 1 phase, 60 hertz, with a motor output of 0.51 HP.
3. The airflow rate must be available in high and low settings.
4. The fan motor must be thermally protected.
5. The fan motor must be equipped as standard with adjustable external static pressure (ESP) settings.
6. Fan motor external static pressure for nominal airflow as scheduled on plans.

F. Coil:
1. Coils must be of the direct expansion type constructed from copper tubes expanded into aluminum fins to form a mechanical bond.
2. The coil must be of a waffle louver fin and high heat exchange, rifled bore tube design to ensure highly efficient performance.
3. The coil must be a 3-row cross fin copper evaporator coil with 13 fpi design completely factory tested.
4. The refrigerant connections must be flare connections and the condensate will be 1-5/16 inch outside diameter PVC.
5. A thermistor will be located on the liquid and gas line.

G. Electrical:
1. A separate power supply will be required of 208/230 volts, 1 phase, 60 hertz. The acceptable voltage range must be 187 to 253 volts.
2. Transmission (control) wiring between the indoor and outdoor unit must be a maximum of 3,280 feet (total 6,560 feet).
3. Transmission (control) wiring between the indoor unit and remote controller must be a maximum distance of 1,640 feet.

H. Control:

1. The unit must have controls provided to perform input functions necessary to operate the system.
2. The unit must be compatible with interfacing with a BMS system via optional BACnet gateways.
3. Provide low profile thermistor button sensor to connect to indoor AC unit local controller. Refer to paragraph 2.10 of this specification.
4. The unit must be compatible with a multi-zone controller.

2.7 WALL MOUNTED UNIT

A. General: Indoor unit must be a wall mounted fan coil unit, operable with refrigerant R-410A, equipped with an electronic expansion valve, for installation onto a wall within a conditioned space. A mildew-proof, polystyrene condensate drain pan and resin net mold resistant filter must be included as standard equipment. The indoor units sound pressure must range from 31 dB(A) to 40 dB(A) at low speed measured at 3.3 feet below and from the unit.

B. Indoor Unit:
   1. The indoor unit must be completely factory assembled and tested. Included in the unit is factory wiring, piping, electronic proportional expansion valve, control circuit board, fan motor thermal protector, flare connections, condensate drain pan, self-diagnostics, auto-restart function, 3-minute fused time delay, and test run switch. The unit must have an auto-swing louver which ensures efficient air distribution, which closes automatically when the unit stops. The remote controller must be able to set five (5) steps of discharge angle. The front grille must be easily removed for washing. The discharge angle must automatically set at the same angle as the previous operation upon restart. The drain pipe can be fitted to from either left or right sides.
   2. Indoor unit and refrigerant pipes will be charged with dehydrated air prior to shipment from the factory.
   3. Both refrigerant lines must be insulated from the outdoor unit.
   4. Return air must be through a resin net mold resistant filter.
   5. The indoor units must be equipped with a condensate pan.
   6. The indoor units must be equipped with a return air thermistor.
   7. The indoor unit will be separately powered with 208~230V/1-phase/60Hz.
   8. The voltage range will be 253 volts maximum and 187 volts minimum.

D. Unit Cabinet:
   1. The cabinet must be affixed to a factory supplied wall mounting template and located in the conditioned space.
   2. The cabinet must be constructed with sound absorbing foamed polystyrene and polyethylene insulation.

E. Fan:
   1. The fan must be a direct-drive cross-flow fan, statically and dynamically balanced impeller with high and low fan speeds available.
   2. The fan motor must operate on 208/230 volts, 1 phase, 60 hertz with a motor output range 0.054 to 0.058 HP.
   3. The airflow rate must be available in high and low settings.
   4. The fan motor must be thermally protected.

F. Coil:
   1. Coils must be of the direct expansion type constructed from copper tubes expanded into aluminum fins to form a mechanical bond.

2. The coil must be of a waffle louver fin and high heat exchange, rifled bore tube design to ensure highly efficient performance.
3. The coil must be a 2-row cross fin copper evaporator coil with 14 fpi design completely factory tested.
4. The refrigerant connections must be flare connections and the condensate will be 11/16 inch outside diameter PVC.
5. A thermistor will be located on the liquid and gas line.
6. A condensate pan must be located in the unit.

G. Electrical:
1. A separate power supply will be required of 208/230 volts, 1 phase, 60 hertz. The acceptable voltage range must be 187 to 253 volts.
2. Transmission (control) wiring between the indoor and outdoor unit must be a maximum of 3,280 feet (total 6,560 feet).
3. Transmission (control) wiring between the indoor unit and remote controller must be a maximum distance of 1,640 feet.

H. Control:
1. The unit must have controls provided by the manufacturer to perform input functions necessary to operate the system.
2. The unit must be compatible with interfacing with a BMS system via optional LonWorks or BACnet gateways.

I. Accessories:
1. Remote temperature sensor.
2. Condensate pump.

2.8 VERTICAL AIR HANDLING UNIT

A. General:
1. Indoor unit must be multi-poise design capable of a floor mounted vertical or horizontal right air handling unit, operable with refrigerant R-410A, equipped with an electronic expansion valve and direct-drive ECM type fan with auto CFM adjustment, for installation within a conditioned space. When installed in a vertical configuration it must have top discharge air and bottom return air. When installed in a horizontal right configuration it must have a horizontal discharge air and horizontal return air
2. This compact design with pre-painted heavy-gauge steel casing must be available in capacities of 12,000 Btu/h to 54,000 Btu/hr.
3. Remote temperature sensor kit must be required for all indoor units not utilizing the thermistor in the remote controller. Computerized PID control must be used to control superheat to deliver a comfortable room temperature condition. The unit must be equipped with a programmed drying mechanism that dehumidifies while limiting changes in room temperature when used with remote control.

B. Indoor Unit:
1. The indoor unit components must be completely factory assembled and tested. Included in the unit is factory wiring, piping, electronic proportional expansion valve, control circuit board, fan motor thermal protector, brazed connections, self-diagnostics, auto-restart function, 3-minute fused time delay, and test run switch.
2. Indoor unit and refrigerant pipes will be charged with dehydrated air prior to shipment from the factory.
3. Both refrigerant lines must be insulated from the outdoor unit.
4. Return air must be through an optional or field supplied filter.
5. Condensate draining must be made via gravity or external condensate pump.

6. The indoor unit will be separately powered with 208~230V/1-phase/60Hz.
7. The voltage range will be 253 volts maximum and 187 volts minimum.

C. Unit Casing:
1. The cabinet must be constructed with sound absorbing, foil-faced insulation to control air leakage.
2. Select an installation location with adequate structural support, space for service access and clearance for air return and supply duct connections.
3. A field supplied secondary drain pan must be installed.

D. Fan:
1. The fan must be a direct-drive Sirocco type fan, statically and dynamically balanced impeller with high and low fan speeds available.
2. The fan motor must operate on 208/230 volts, 1 phase, 60 hertz with a motor output range 0.2 to 0.5 HP.
3. The airflow rate must be available in high setting.
4. The fan motor must be thermally protected.
5. Fan motor external static pressure for nominal airflow must be 0.5 in wc.

E. Filter:
1. The return air must be filtered by means of a field supplied filter.

F. Coil:
1. Coils must be of the direct expansion type constructed from copper tubes expanded into aluminum fins to form a mechanical bond.
2. The coil must be of a waffle louver fin and high heat exchange, rifled bore tube design to ensure highly efficient performance.
3. The coil must be a 4-row cross fin copper evaporator coil with 15 fpi design completely factory tested.
4. The refrigerant connections must be brazed connections and the condensate will be 3/4 inch outside diameter PVC.
5. A thermistor will be located on the liquid and gas line.

G. Electrical:
1. A separate power supply will be required of 208/230 volts, 1 phase, 60 hertz. The acceptable voltage range must be 187 to 253 volts.
2. Transmission (control) wiring between the indoor and outdoor unit must be a maximum of 3,280 feet (total 6,560 feet).
3. Transmission (control) wiring between the indoor unit and remote controller must be a maximum distance of 1,640 feet.

H. Control:
1. The unit must have controls provided by the manufacturer to perform input functions necessary to operate the system.
2. The unit must be compatible with interfacing with a BMS system via optional LonWorks or BACnet gateways.
3. The unit must be compatible with an advanced multi-zone controller.

I. General
1. Indoor unit must be a built-in ceiling concealed fan coil unit, operable with refrigerant R-410A, equipped with an electronic expansion valve, for installation into the ceiling cavity. The unit must be capable of introducing up to 100% outside air controlled to a fixed discharge air temperature. It is constructed of a galvanized steel casing. It must be

available in capacities from 48,000 Btu/h to 96,000 Btu/h. It must be horizontal discharge air with horizontal return air configuration. All models feature a low height cabinet making them applicable to ceiling pockets that tend to be shallow. Computerized PID control must be used to control superheat to deliver a comfortable room temperature condition. The indoor unit's sound pressure must range from 42 dB(A) to 47 dB(A) at low speed measured 5 feet below the ducted unit.

2.9 REMOTE TEMPERATURE SENSOR

A. The Remote Temperature Sensor must provide temperature sensing for all indoor units. The remote controller wiring consists of a non-polar two-wire connection to the indoor unit at terminals.

B. The Remote Temperature Sensor is wall mounted and is used to maintain the optimal operation of the connected indoor unit.

C. The Remote Temperature Sensor must be used in conjunction with the Navigation Remote Controller and the Wireless Remote Controller to sense space temperature outside of the indoor unit.

D. Mounting
1. Must be mounted on the wall in the provided sensor box.
2. Can be mounted a button temperature filed supplied sensor holder

E. Basic Operation
1. Replaces indoor unit return air temperature sensor.
2. Senses room temperature for only one indoor unit

2.10 REMOTE CONTROLLER

A. The Remote Controller can provide control for all VRV/VRF indoor units. The remote controller wiring consists of a non-polar two-wire connection to the indoor unit at terminals P1/P2. The Remote Controller is wall mounted and can be adjusted to maintain the optimal operation of the connected indoor unit(s).

B. Mounting: The Remote Controller must be mounted into a standard 2" x 4" junction box.

C. Display Features:
1. The Remote Controller must be approximately 4.75" x 4.75" in size with a backlit 2.75" x 1.75" LCD display.
2. Display information must be selectable from English, French, or Spanish.
3. Feature Backlit LCD Display with contrast adjustment and auto off after 30 seconds.
4. The controller must display Operation Mode, Setpoint, and Fan Speed.
5. System Status icons in large font.
   a. The controller must display temperature setpoint in one-degree increments with a range of 60-90ºF.
6. Detailed display will reflect room temperature (0-176ºF/-17-80ºC range in one degree increment).
   a. Display of temperature information must be configurable for Fahrenheit or Celsius
7. On/Off status must be displayed with an LED.
8. Error codes will be displayed in the event of system abnormality/error with a two-digit code.
   a. A blinking LED will also signal system abnormality/error.

9. The following system temperatures can be displayed to assist service personnel in troubleshooting:
    a. Return Air Temperature
    b. Liquid Line Temperature
    c. Gas Line Temperature
    d. Discharge Air Temperature (depending on unit).
    e. Remote Controller Sensor Temperature
    f. Temperature used for Indoor Unit Control

D. Basic Operation:
1. Capable of controlling a group of up to 16 indoor units.
2. Controller must control the following group operations:
    a. On/Off, Operation Mode (Cool, Heat, Fan, Dry and Auto).
    b. Independent Cooling and Heating setpoints in the occupied mode.
    c. Independent Cooling Setup and Heating Setback setpoints in the unoccupied mode
    d. Fan Speed.
    e. Airflow direction (dependent on indoor unit type).
    f. The controller must be able to limit the user adjustable setpoint ranges individually for cooling and heating in the occupied period.
    g. Lock out key settings.
    h. Indoor unit group assignment.

E. Programmability:
1. Controller must support schedule settings with selectable weekly pattern options.
    a. 7-day.
    b. Weekday + Weekend.
    c. Weekday + Saturday + Sunday.
    d. The schedule must support unit On/Off.
    e. Independently settable Cooling and/or Heating setpoints when unit is on (occupied).
    f. Setup (Cooling) and Setback (Heating) setpoints when unit is off (unoccupied)
    g. A maximum of 5 operations can be schedulable per day.
    h. Time setting in 1-minute increments.
2. The Controller must support auto-changeover mode for both heat pump and heat recovery systems allowing the optimal room temperature to be maintained by automatically switching the indoor unit's mode between Cool and Heat according to the room temperature and temperature setpoint.
    a. Changeover to cooling mode must occur at cooling setpoint + 1°F.
    b. Changeover to heating mode must occur at heating setpoint - 1°F.
3. The Controller must support an Auto Off Timer for temporarily enabling indoor unit operation during the unoccupied period.
    a. When the Off Timer is enabled and when the unit is manually turned on at the remote controller.
    b. The controller must shut off the unit after a set time period.
    c. The time period must be configurable in the controller menu with a range of 30-180 minutes in 10-minute increments.
4. The room temperature must be capable of being sensed at either the thermostat, the Indoor Unit return air temperature sensor, or Remote Temperature Sensor configured through the Remote Controller field settings.

2.11 INTELLIGENT TOUCH CENTRAL CONTROLLER (ITCC)

A. The Intelligent Touch Central Controller (ITCC) must provide control for all outdoor and indoor units. It must be capable of controlling a maximum or 64 indoor unit groups and 128 indoor units connected to a maximum of 10 outdoor units. The ITCC must support operations superseding that of the local remote controller, system configuration, daily/weekly scheduling, monitoring of operation status, and malfunction monitoring.

B. The controller wiring must consist of a non-polar two-wire connection. The ITCC is wall mounted and can be adjusted to maintain the optimal operation of the connected indoor unit(s).

C. The ITCC can be used in conjunction with the individual unit, controllers, Bacnet interface, Lonworks interface, and Modbus adapter to control the same indoor unit groups. BACnet MS/TP interfaces to control the same indoor unit groups. No more than 2 remote controllers can be placed in the same group. The remote controller must require daisy chain wiring for grouping multiple indoor units (up to 16) together. Manual addressing is required of each indoor unit group associated with the Intelligent Touch Controller.

D. The ITCC must be equipped with one RJ-45 Ethernet port to support interconnection with a network PC via the internet or Local Area Network (LAN).

E. Web access functions must be available so that facility staff can securely log into each ITCC via the PC's web browser to support monitoring, scheduling, error recognition, and general user functions. Error emails are also sent to designated email addresses. An additional optional software function Power Proportional Distribution (PPD) tenant billing must also be available. The optional software must require advanced purchase and can only be activated upon receipt of a license activation key from manufacturer.

F. The controller must include a BACnet gateway for interface with a BACnet BMS system.

G. Optional software functions must be available so that facility staff can securely log into each ITCC via the PC's web browser to support monitoring, scheduling, error email, and general user functions.

H. Mounting: The ITCC must be mounted on the wall or into a recessed fixing box.

I. Display Features:
   1. The ITCC must be approximately 12" x 510" in size with a backlit 10" LCD display.
   2. Display information must be selectable from English, French, Italian, German, or Spanish.
   3. Featured backlit LCD with contrast adjustment and auto off after 30 minutes (default) is adjustable between 1 to 60 minutes.
   4. The Controller must display On/Off, Operation Mode, Setpoint, Space Temperature, Louver Position, Fan Speed for Group/Zone.
   5. The Controller must display Date (mm/dd/yyyy or dd/mm/yyyy format selectable) and day of the week along with the time of day (12hr or 24hr display selectable).
   6. The Controller must adjust for daylight savings time (DST) automatically.
   7. Display information must be updated every 3 seconds to show the latest status of the indoor unit groups.
   8. System status icons must display On/Off (color coded), Malfunction/Error (color coded), Forced Stop, Set Schedule/Setback/Auto-changeover, Filter, and Screen Lock.
   9. The controller must display the temperature setpoint in one degree increments with a range of 600ºF – 900ºF.

10. Display of temperature setpoint information must be configurable for Fahrenheit or Celsius
11. Display must reflect room temperature 0ºF – 176ºF range in one degree increment.
12. Display of room temperature information must be configurable for Fahrenheit or Celsius
13. The System Setting Mode must be used to configure options and display information for each Zone or Group.
14. Zone configuration must display Setpoint Range Limitation, Setback Temperature setting, and Auto-changeover for each Zone.
15. Indoor units must be capable of being displayed by Zone or Group.
    a. Zones configuration via the ITCC must consist of a single indoor unit group or a collection of indoor unit groups blocked together for control and monitoring purposes.
    b. Groups must consist of 1 to 16 indoor units daisy chained together via the remote-control wiring on P1P2 of the indoor unit terminal block for control and monitoring purposes
    c. Capable of displaying site floor plan or graphical user interface (GUI) as the background for visual navigation.
    d. Groups and Zones may be assigned names.
16. Error status must be displayed in the event of system abnormality/error with one of two color coded icons placed over the indoor unit icon.
    a. Communication errors between the MZCC and the indoor units must be displayed with a blue triangle placed over the indoor unit icon.
    b. System errors between the MZCC and the indoor units must be displayed with a yellow triangle placed over the indoor unit icon.
    c. Error history must be available for viewing the 10 most recent errors/abnormalities.

J. Basic Operation
1. Capable of controlling Zone(s) or Group(s) of up to 64 indoor unit groups (128 indoor units).
2. Controller must control the following group operations:
    a. On/Off.
    b. Operation Mode (Cool, Heat, Fan, Dry, and Auto).
    c. Independent Cooling and Heating setpoints in the occupied mode.
        1) Cooling setpoint must be maintained higher than or equal to the heating setpoint.
        2) Adjustable minimum setpoint differential 0ºF – 70ºF between cooling and heating setpoints.
        3) Selectable single setpoint mode.
    d. Independent Setup (Cooling) and Setback (Heating) setpoints in the unoccupied mode adjustable to 40º – 95ºF.
        1) Setup and Setback setpoints must be set outside of the occupied setpoint range.
        2) The recovery differential must be 40ºF (default) and adjustable between 2 – 100ºF.
        3) Settings must be applied based upon the Zone configurations.
    e. Fan Speed:
        1) Up to 3 speeds (dependent upon indoor unit type)
    f. Airflow Direction:
        1) 5 fixed positions or swing positions.

g. The controller must be able to limit the user adjustable setpoint ranges individually for cooling and heating based upon the Zone configurations.
h. Remote controller permit/prohibit of On/Off, Mode, and Setpoint
i. Lock out setting for ITCC display.
j. Indoor unit Group/Zone assignment.

3. Capable of providing battery backup power for up to 2 years in total time for the clock.
   a. Settings stored in non-volatile memory.

K. Programmability
1. Controller must support weekly schedule settings.
   a. Selectable weekly patterns
      1) 7-day.
      2) Weekday + Weekend.
      3) Weekday + Saturday + Sunday.
   b. The schedule must support unit On/Of.f
      1) Each scheduled event must specify time and target Zone or Group
      2) Each scheduled event must include On/Off, Operation Mode, Occupied Cooling Setpoint, Occupied Heating Setpoint, Setup (Cooling) Setpoint, Setback (Heating) Setpoint, Remote Controller On/Off Prohibit, Remote Controller Mode Prohibit, Remote Controller Setpoint Prohibit, and Timed Override Enable.
      3) Independently settable Cooling and Heating setpoints when unit is On (occupied).
      4) Setup (Cooling) and Setback (Heating) setpoints when unit is Off (unoccupied) by Zone.
      5) Time setting in 1-minute increments.
      6) A 2 hour override must be provided for use enabling indoor unit operation during the unoccupied period.
      7) Support auto- changeover.
   c. 8 independent schedules configurable with up to 8 events settable for each schedule
      1) Exception days must be used to override specified days on the weekly schedule based upon irregular occupied/unoccupied conditions.
      2) Exception days can be configured on a set date (Jan 1) or floating date (1st Monday in September).
   d. A maximum of 40 exception days can be scheduled on the yearly schedule.
2. Controller must support Interlock.
   a. Interlock feature for use with 3rd party equipment (DOAS, dampers, occupancy sensing, etc.) to automatically control groups or zones corresponding to the change of the operation states or the On/Off states of any group.
   b. Requires Digital Input/Output unit or Digital Input unit.
      1) On/Off based monitoring and control of equipment.
      2) Manual or scheduled operation of equipment.
      3) Operation based upon interlock with VRV/VRF indoor unit group(s)
      4) Monitor equipment error/alarm status.
   c. Controller must support force shutdown of associated indoor unit groups.
3. We/ Email Function.
   a. It must also be capable of creating general user access and sending detailed error emails to a customized distribution list.

PART 3 - EXECUTION.

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION REQUIREMENTS

A. The system must be installed by a trained subcontractor with complete knowledge of the installation and commissioning of the proposed VRV system.

B. Install indoor evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure. Provide neoprene hanger for isolation. Refer to specification section 230548.13 “Vibration Control for HVAC”.

C. Install outdoor compressor-condenser components on restrained, spring isolators secured to steel dunnage. Refer to specification section 230548.13 “Vibration Control for HVAC”.

3.3 CONNECTIONS

A. Connect pre-charged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.

B. Connect drain piping and route to nearest indirect drain.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.

B. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.

C. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Remove malfunctioning units, replace with new components, and retest.

D. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

END OF SECTION 23 81 29

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 23 82 16.14 – ELECTRIC-RESISTANCE AIR COILS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section Includes:
   1. Duct Mounted Electric Heater

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data

   1. Submit copies of manufacturer's latest published literature for materials specified herein for approval, and obtain approval before materials are delivered to the site.

   2. Data must include manufacturer's specifications for terminal units showing dimensions, capacities, ratings, performance characteristics, gauges and finishes of materials, and installation instructions.

B. Shop Drawings: Shop drawings for work specified herein must be submitted for approval. Shop drawings must show assembly-type drawings showing unit dimensions, construction details, and field connection details.

C. Wiring Diagrams: Submit manufacturer's electrical requirements for power supply wiring to terminal units. Submit manufacturer's ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of factory-installed and field-installed wiring.

D. Samples: Submit 3 samples for each type of cabinet finish furnished.

E. Maintenance Data: Submit maintenance instructions, including lubrication instructions, filter replacement, motor and drive replacement, and spare parts lists. Include this data, product data, and shop drawings in maintenance manuals in accordance with General Conditions requirements as applicable.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Material and installation must comply with the 2014 NYC Building Code, recommended practices, and standards of NEC, NEMA and U.L.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials and handle as to prevent the inclusion of foreign materials and the damage of breaking, denting and scoring. Do not install damaged terminal units or components; replace with new.

B. Store materials and equipment where designated. Protect from weather, dirt, fumes, water, construction debris, and physical damage. Contractor must assume responsibility and security for materials and equipment. Take precautions for protection from detrimental conditions.

C. Comply with Manufacturer's rigging and installation instructions for unloading terminal units and moving them to final location.

1.7 WARRANTY

A. Manufacturer must provide warranty for a period of one year from substantial completion. Warranty must cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer’s written instructions for installation, operation and maintenance have been followed.

PART 2 - PRODUCTS

2.1 DUCT MOUNTED ELECTRIC HEATER (EDH)

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Neptronic.
   2. Brasch Manufacturing Company, Inc.
   3. Industrial Engineering and Equipment Company (INDEECO).
   4. Or approved equal.

B. Provide as indicated and scheduled on the drawings, slip-in heaters. Voltage, phase, size and wattage and type of control must be as shown on plans.

C. Approvals – Heaters and panelboards (if required) must meet the requirements of the National Electrical Code and must be listed by Underwriters Laboratories, for zero spacing between the duct and combustible surfaces, and for use with heat pumps, and air conditioning equipment.

D. Heating elements must consist of coil, 80% nickel, 20% chromium, Grade A resistance wire, precisely centered in a stainless steel tube filled with granular magnesium oxide. A stainless steel fin is to be helically wound onto the tube. Elements are to be furnished with mounting flanges, making them individually removable through the terminal box.

E. Heater frames and terminal boxes must be corrosion resistant steel. Unless otherwise indicated, the terminal box must be NEMA 1 construction and must be provided with a hinged latching cover and multiple concentric knockouts for field wiring.

F. All heaters must be furnished with triple overtemperature protection. A disc type and linear, automatic reset thermal cutout are included for primary overtemperature protection. All heaters must also be furnished with a linear type manual reset thermal cutout with backup contactors (as required). For secondary overtemperature protection, heat limiters or other fusible overtemperature devices are not acceptable.

G. Heaters must be rated for the voltage, phase, and number of heating stages indicated in the schedule. All three-phase heaters must have equal balanced three-phase stages. All internal wiring must be stranded copper with 105°C insulation and must be terminated in crimped connectors or box lugs.

H. Terminal blocks must be provided for all field wiring and must be sized for installation of 75°C copper wire rated in accordance with NEC requirements.

I. Thermal cutouts, airflow switch, contactors (where required), SCR, fuses (if over 48 amps), control circuit transformer (where required) and built-in, snap-acting, door interlocked disconnect switch.

J. When specified in the schedule, or below, heaters will be supplied with the following Special Features:
   1. Branch circuit fuses to meet NEC.
   2. Magnetic contactors with fused control transformer.
   3. Non-fused disconnect.
   4. Airflow switch
   5. Dust-tight terminal box
   6. Transformer primary fusing
   7. Low Airflow” pilot light
   8. “Heater On” pilot light “Overtemperature” pilot light
   9. Proportional electronic duct thermostat with set point adjuster

K. If controllers are located remote from duct heater, the wiring between the heater and controller must be furnished and installed by the Contractor.

L. Silicone controlled rectifiers (SCRs) are used to provide very close heat control and/or silent operation for critical areas such as laboratories, computer rooms and executive offices. They are a solid state device with no moving parts which will provide 100% stepless and noiseless modulation through many years of trouble free service. The SCR has heat sink mounted protruding through the terminal box to maximize convection cooling. The heat sink is electrically insulated from live parts. Power and heat output are precisely controlled from zero to 100% in direct response to the modulating duct mounted discharge temperature sensor set at 47°F.

M. Over temperature protection will be provided by pilot duty built and capillary independent automatic and manual reset thermal cut-outs. Heat limiters are not acceptable.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine conditions at the job site where work of this section is to be performed to ensure proper arrangement and fit of the work. Start of work implies acceptance of job site conditions.

3.3 PREPARATION

A. Examine the Contract Drawings and specifications in order to ensure the completeness of the work required under this Section.

B. Verify measurements and dimensions at the job site and cooperate in the coordination and scheduling of the work of this Section with the work of related trades, so as not to delay job progress.

3.4 INSTALLATION

A. Installation of Electric Heaters:

1. Install duct heaters as indicated, and in accordance with manufacturer's installation instructions.

2. Install wiring as indicated.

B. Electrical Wiring:

1. Install electrical devices furnished by manufacturer but not specified to be factory-mounted. Furnish copy of manufacturer's wiring diagram submittal to Electric Contractor.

2. Verify that electrical wiring installation is in accordance with manufacturer's submittal and 2014 NYC Electrical Code. Do not proceed with equipment startup until wiring installation is acceptable to equipment manufacturer.

3.5 ADJUSTING AND CLEANING

A. After construction is completed, including painting, clean unit exposed surfaces, vacuum clean coils and inside of cabinets. Retouch any marred or scratched surfaces of factory-finished cabinets, using finish materials furnished by manufacturer.

END OF SECTION 23 82 16.14

SECTION 23 82 39.19 – WALL AND CEILING UNIT HEATERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section Includes:
   1. Wall Unit Heaters.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data

   1. Submit copies of manufacturer's latest published literature for materials specified herein for approval, and obtain approval before materials are delivered to the site.
   2. Data must include manufacturer's specifications for terminal units showing dimensions, capacities, ratings, performance characteristics, gauges and finishes of materials, and installation instructions.

B. Shop Drawings: Shop drawings for work specified herein must be submitted for approval. Shop drawings must show assembly-type drawings showing unit dimensions, construction details, and field connection details.

C. Wiring Diagrams: Submit manufacturer's electrical requirements for power supply wiring to terminal units. Submit manufacturer's ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of factory-installed and field-installed wiring.

D. Samples: Submit 3 samples for each type of cabinet finish furnished.

E. Maintenance Data: Submit maintenance instructions, including lubrication instructions, filter replacement, motor and drive replacement, and spare parts lists. Include this data, product data, and shop drawings in maintenance manuals in accordance with the DDC General Conditions requirements as applicable.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Material and installation must comply with the latest edition of application codes, recommended practices, and standards of NEC, NEMA and U.L.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials and handle as to prevent the inclusion of foreign materials and the damage of breaking, denting and scoring. Do not install damaged terminal units or components; replace with new.

B. Store materials and equipment where designated. Protect from weather, dirt, fumes, water, construction debris, and physical damage. Contractor must assume responsibility and security for materials and equipment. Take precautions for protection from detrimental conditions.

C. Comply with Manufacturer's rigging and installation instructions for unloading terminal units, and moving them to final location.

1.7 WARRANTY

A. Manufacturer must provide warranty for a period of one year from substantial completion. Warranty must cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer’s written instructions for installation, operation and maintenance have been followed.

PART 2 - PRODUCTS

2.1 WALL UNIT HEATER (WH-1, EH-1)

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Stelpro.
   2. Qmark.
   3. Berko.
   4. Or approved equal.

B. Furnish and install where indicated on plans ceiling mount air curtain heater suitable for continuous operation. Heaters must be UL listed.

C. Enclosure: The heaters must be fabricated of minimum 20-gauge steel cabinet, 18 gauge steel grille with epoxy-polyester powder coat finish, constructed for easy access for maintenance. Standard color must be white / soft white. Custom color as selected by Commissioner.

D. Airflow configuration: Top air intake with bottom air discharge.

E. Heating Element: The heating element wire must consist of 80% nickel, 20% chromium.

F. Fan and Motor: Propeller fan, factory lubricated motor.

G. Control: Integral disconnect switch and tamper proof built-in thermostat.

H. Heaters must be designed to permit use of supply conductors with 60°C insulation.

I. Protection: Linear thermal cut-out must be factory installed to automatically shut off heater in event of overheating and reactivate heater when temperatures return to normal. The complete heater must have a height of 6-3/4 inches and a depth of 2-7/8 inches.

J. Mounting: Wall mount, recessed or surface mount. Provide adapter for surface mount installation.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine conditions at the job site where work of this Section is to be performed to ensure proper arrangement and fit of the work. Start of work implies acceptance of job site conditions.

3.3 PREPARATION

A. Examine the Contract Drawings and specifications to ensure the completeness of the work required under this Section.

B. Verify measurements and dimensions at the job site and cooperate in the coordination and scheduling of the work of this Section with the work of related trades, so as not to delay job progress.

3.4 INSTALLATION

A. Installation of Electric Heaters

1. Install heaters as indicated, and in accordance with manufacturer's installation instructions.

2. Locate heaters as indicated, coordinate with other trades and Commissioner. Ensure that required clearance are maintained to combustible construction and as per manufacturer’s written instructions.

3. Install wiring as indicated.

B. Electrical Wiring

1. Install electrical devices furnished by manufacturer but not specified to be factory-mounted. Furnish copy of manufacturer's wiring diagram submittal to electrical trade.

2. Verify that electrical wiring installation is in accordance with manufacturer's submittal and compliance with 2014 NYC Electrical Code. Do not proceed with equipment startup until wiring installation is acceptable to equipment manufacturer.

3.5 ADJUSTING AND CLEANING

A. After construction is completed to include painting, clean unit exposed surfaces, vacuum clean coils and inside of cabinets. Retouch any marred or scratched surfaces of factory-finished cabinets, using finish materials furnished by manufacturer.

END OF SECTION 23 82 39.19

SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes

1. Sleeves for raceways and cables.
2. Sleeve seals.
3. Grout.
4. Common electrical installation requirements.
5. Submittals.
6. Coordination drawings.
7. Record documents.
8. Maintenance manuals.
9. Rough ins.
10. Electrical installations.
11. Cutting and patching.
12. Codes, Permits and Inspections.
13. Separation of Work Between Trades.
14. Definitions and Interpretations.

B. Related Sections

1. Section 07 84 13 “Penetration Firestopping” for fire stopping at penetrations.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For sleeve seals.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

PART 2 - PRODUCTS

2.1 SLEEVES FOR RACEWAYS AND CABLES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

2.2 SLEEVE SEALS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Advance Products & Systems, Inc.
2) Calpico, Inc.
3) Metraflex Co.
4) Pipeline Seal and Insulator, Inc.
5) Or Approved Equal

2. Sealing Elements: EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.

2.3 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, non-staining, mixed with water to consistency suitable for application and a 30-minute working time.

2.4 TOUCH UP PAINT

A. For Equipment: Equipment manufacturer's paint selected to match installed equipment finish.

B. Galvanized Surfaces: Zinc rich paint recommended by item manufacturer.

2.5 ACCESS DOOR IN FINISHED CONSTRUCTION

A. Access doors as required for operation and maintenance of concealed equipment, valves, controls, etc. will be provided by another trade.
1. Coordinate access door location, size and its accessibility to the outlet box, junction box, or equipment being served.
2. Coordinate and prepare a location, size, and function schedule of access doors required and deliver to a representative of the installing trade.

3. Access doors are of ample size, minimum of 16 inches x 16 inches (40 cm. x 40 cm.).

PART 3- EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

A. Comply with NECA 1.

B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

E. Right of Way: Give to piping systems installed at a required slope.

3.3 ROUGH-IN

A. Verify final locations for rough ins with field measurements and with the requirements of the actual equipment to be connected.

3.4 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.

B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

E. Cut sleeves to length for mounting flush with both surfaces of walls.

F. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.

G. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable, unless indicated otherwise.

H. Seal space outside of sleeves with grout for penetrations of concrete and masonry.

I. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.

J. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint.

K. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials.

L. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

3.5 SLEEVE-SEAL INSTALLATION

A. Install to seal exterior wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.6 FIRESTOPPING

A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Section 07 84 13 “Penetration Firestopping” and Section 07 92 00 “Joint Sealers”.

3.7 FOUNDATIONS

A. General

1. All equipment, including but not limited to Switchgear, and Switchboards, are provided with foundations.
2. Each piece of equipment is set on a concrete base minimum 4 inches (10 cm.) high and extending 3 inches (8 cm.) beyond the equipment in all directions. Bases are integrally keyed to structural slab.

3.8 REFINISHING AND TOUCH UP PAINTING

A. Clean damaged and disturbed areas and apply primer, intermediate, and finish coats to suit the degree of damage at each location.

B. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.

C. Restore damage to galvanized finishes with zinc rich paint recommended by manufacturer.

3.9 FIELD QUALITY CONTROL

A. Inspect installed components for damage and faulty work, including the following:
   1. Touch up painting.

3.10 CLEANING AND PROTECTION

A. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.

B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

END OF SECTION 26 05 00

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes building wires and cables and associated splices, connectors, and terminations for wiring systems rated 600 volts and less.

B. Related Sections

1. Section 26 05 29 "Hangers and Supports for Electrical Systems" for hangers and supports.

2. Section 26 05 53 "Identification for Electrical Systems" for identification.

3. Section 28 46 20 "Fire Alarm" for conductors and cables for fire alarm system.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: for each type of product indicated.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Listing and Labeling: Provide products specified in this Section that are Underwriters Laboratories listed and labeled.

1. The Terms "Listed and Labeled": As defined in the "National Electrical Code," Article 100.

C. Comply with NFPA 70-2008, as amended by New York City Electrical Code - 2014.

1.6 WARRANTY

A. The manufacturer must provide a minimum one-year warranty on all power conductors

and cables supplied against manufacturing defects from the date of substantial completion.

1.7 GUARANTEE

A. Provide a minimum one-year guarantee for installation of all conductors and cables from the date of substantial completion.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. American Insulated Wire Corp.; a Leviton Company.

2. General Cable Corporation.

3. Senator Wire & Cable Company.

4. Southwire Company.

5. Belden, Division Cooper Industries.

6. Cable & Wire Division, AT&T.

7. Pyrotenax.

8. Or approved equal.

B. Refer to Part 3 "Conductor and Insulation Applications" Article for insulation type, cable construction, and ratings.

1. Conductor Material: Copper complying with NEMA WC 5 or 7; solid conductor for No. 10 AWG and smaller, stranded for No. 8 AWG and larger.

2. Conductor Insulation Types: Type THHN, THWN, XHHW complying with NEMA WC 5 or 7.

C. Where required by code, or where indicated on the drawings, feeders and circuitry are 2-hour rated cable or cable system, except where enclosed within 2-hour rated construction indicated on the architectural drawings.

2.2 CONNECTORS AND SPLICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.

2. AMP Incorporated/Tyco International.

3. Hubbell/Anderson.

4. O-Z/Gedney; EGS Electrical Group LLC.

5. 3M Company; Electrical Products Division.

6. Or approved equal.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 WIRE AND INSULATION APPLICATIONS

A. Utilize copper conductors with THWN, THHN or XHHW insulation, except provide THHW-2, THWN-2 or XHHW-2 insulation for conductors 1/0 and larger in "wet" locations. Conductors utilized in underground installations are UL Listed for use in wet locations. Conductors are run in raceways as described in Section 26 05 33 “Raceways and Boxes for Electrical Systems”. Type THHW and THHW-2 are not utilized where excluded by conduit sizing. Type THWN are not utilized for connection to 100% rated overcurrent devices.

B. In general, cable ampacities are based on a 60 degree C rating for cables #1 AWG and smaller and on a 75 degree C rating for larger cables.

C. Low voltage circuits intended for the distribution of voice or data utilize communications cables (complying with requirements of Article 800 of the National Electrical Code) having characteristics as follows:

1. Cables are of a fluoropolymer type having adequate fire-resistant and low-smoke producing characteristics and are U.L. listed for plenum use (Type CMP), except that where run in conduit, they may be U.L. type CM.
2. Refer to Section 28 46 20 "Fire Alarm" for fire alarm system wiring.

3.3 INSTALLATION

A. Conceal cables in finished walls, ceilings and floors unless otherwise indicated.

B. Use manufacturer-approved pulling compound or lubricant where necessary; compound

used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

C. Use pulling means including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

D. Install exposed cables, parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible.

E. Support cables according to Section 26 05 29 "Hangers and Supports for Electrical Systems."

F. Seal around cables penetrating fire-rated elements according to Section 07 84 13 “Penetration Firestopping”.

G. Identify wires and cables according to Section 26 05 53 "Identification for Electrical Systems".

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

C. Maintain all splices and joints in removable cover boxes or cabinets where they may be easily inspected.

D. Locate each completed conductor splice or joint in the outlet box, junction box, or pull box containing it, so that it is accessible from the removal cover side of the box.

E. Join solid conductors #8 AWG and smaller by securely twisting them together and soldering, or by using insulated coiled steel spring "wire nut" type connectors. Exclude "wire nuts" employing non-expandable springs. Terminate conductors #8 AWG and smaller by means of a neat and fast holding application of the conductors directly to the binding screws or terminals of the equipment or devices to be connected. Terminals and connectors are U.L. approved specifically for the application.

F. Join, tap and terminate stranded conductors #6 AWG and larger by means of solder sleeves, taps and lugs with applied solder or by means of pressure indent type connectors, or mechanical connectors utilizing ball tipped set screws. Apply pressure indent type connectors, utilizing tools manufactured specifically for the purpose and having features preventing their release until the full pressure has been exerted on the lug or connector. Factory installed equipment or device terminals are of types UL approved specifically for the application.

G. Except where wire nuts are used, build up insulation over conductor joints to a value

equal both in thickness and dielectric strength to that of the factory applied conductor insulation. Insulation of conductor taps and joints are by means of half-lapped layers of rubber tape, with an outer layer of friction tape; by means of half-lapped layers of approved plastic electric insulating tape; or by means of split insulating casings manufactured specifically to insulate the particular connector and conductor, and fastened with stainless steel or non-metallic snaps or clips.

H. Exclude splicing procedures for neutral conductors in lighting and appliance branch circuitry which utilize device terminals as the splicing points.

I. Exclude joints or terminations utilizing solder in any conductors used for grounding or bonding purposes.

J. Exclude all but solder or pressure indent type joints in conductors used for signaling or communications purposes.

3.5 INSTALLATION OF CIRCUITRY FOR MISCELLANEOUS LOW VOLTAGE SYSTEMS

A. Comply with requirements described in applicable subsections of this Section. Circuitry requirements for low voltage systems must be as follows:

1. Wiring for miscellaneous low voltage systems may be run without conduit - subject to the approval by Commissioner - except where prohibited by other sections of these specifications or by indications on the drawings.

2. Where conduit is required, it is steel electric metallic tubing (EMT), except that it is galvanized intermediate steel conduit where located within 8 feet (2.4 m) of the floor in mechanical spaces (or is otherwise exposed to mechanical damage).

3. Wires and cables have characteristics - in compliance with Articles 725 and/or 800 (as applicable) of the New York City Electrical Code 2014- as described elsewhere in the specifications or drawings for this project, and are U.L. listed in accordance therewith.

4. Where wires and cables are permitted to be run without conduit, they are independently supported from the building structure or ceiling suspension systems at intervals not exceeding four feet on center, utilizing cable supports specifically approved for the purpose. Wires and cables do not rest on or depend on support from suspended ceiling media (tiles, lath, plaster, as well as splines, runners or bars in the plane of the ceiling), nor are they supported from pipes, ducts or conduits. Where cables are bundled together, separate bundles are provided separately for each type of cabling and separately for each independent system. Bundling and/or supporting ties are of a type suitable for use in a ceiling air handling plenum regardless of whether or not installed in a plenum.

5. Cables are tagged or labeled at each termination point and in each intermediate junction box, pull box or cabinet through which they pass.

6. Comply with applicable requirements for locating and routing circuitry, for installing circuitry, and for fire-stopping.

3.6 FIELD QUALITY CONTROL

A. Testing: Perform the following field quality-control testing:

1. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.

2. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters.

B. Test Reports: Prepare a written report to record the following:

1. Test procedures used.

2. Test results that comply with requirements.

3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

END OF SECTION 26 05 19

SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes grounding of electrical systems and equipment. Grounding requirements specified in this Section may be supplemented in other sections of these Specifications.

B. Related Sections

1. Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables" for power conductors and cables.

2. Section 26 05 33 "Raceways and Boxes for Electrical Systems" for raceways for electrical systems.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Field Test Reports: Written reports specified in Part 3.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by Underwriters Laboratories, Inc.

1. Comply with UL 467.

C. Comply with NFPA 70-2008, as amended by New York City Electrical Code-2014.

1.6 WARRANTY

A. The manufacturer must provide a minimum one-year warranty on all grounding and bonding equipment and hardware against manufacturing defects from the date of substantial completion.

1.7 GUARANTEE

A. Provide a minimum one-year guarantee for installation of all grounding installation from the date of substantial completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Thomas & Betts, Electrical
2. Erico Products, Inc.
3. Ideal Industries, Inc.
4. O-Z/Gedney Co.
5. Or approved equal.

2.2 GROUNDING CONDUCTORS

A. For insulated conductors, comply with Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables".

B. Material: Copper.

C. Equipment Grounding Conductors: Insulated with green-colored insulation.

D. Grounding Electrode Conductors: Stranded cable.

E. Underground Conductors: Bare, tinned, stranded, unless otherwise indicated.

F. Bare Copper Conductors: Comply with the following:

1. Solid Conductors: ASTM B 3.
2. Assembly of Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.

G. Copper Bonding Conductors: As follows (except where otherwise indicated):

1. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG copper conductor, 0.25-inch (6.4 mm) in diameter.
2. Bonding Conductor: No. 4 or No. 6 AWG, stranded copper conductor.
3. Bonding Jumper: Bare copper tape, braided bare copper No. 3/0 AWG conductors, terminated with copper ferrules; 1.625 inch (42 mm) wide and 1/16 inch (1.5 mm) thick.
4. Tinned Bonding Jumper: Tinned-copper tape, braided copper No. 30 AWG

conductors, terminated with copper ferrules; 1-5/8 inches (42 mm) wide and 1/26 inch (1.5 mm) thick.

H. Grounding Bus: Bare, annealed copper bars of rectangular cross section, with insulators.

2.3 CONNECTOR PRODUCTS

A. Comply with IEEE 837 and UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items.

B. Connectors: Bolted-pressure-type connectors, or compression type.

C. Bolted Clamps: Heavy-duty type.

D. Pressure Connectors: High-conductivity-plated units.

E. Welded Connections: Exothermic-welded types, in kit form, and selected per manufacturer's written instructions for the specific types, sizes, and combinations of conductors and other items to be connected.

2.4 GROUNDING ELECTRODES

A. Metal Underground Water Pipe: Metal, underground water pipe in direct contact with earth for at least 10-feet (3-meters) and electrically continuous from the points of connection of the electrode conductor and the bonding conductors. Interior metal water pipes located more than 5-feet from the building must not be used.

B. Metal Frame of Building or Structure: Any of the following methods are deemed an acceptable means of making an earth connection through the metal frame of the building structure:

1. At least 10-feet of a single structural metal member in direct contact with earth or encased in concrete which is in direct contact with earth.
2. Structural metal frame is bonded to at least one of the grounding electrodes defined above.
3. Other approved means of establishing a connection to earth.

C. Electrodes Not Permitted for Grounding:

1. Gas piping systems which are metal and underground.
2. Aluminum electrodes.

PART 3 – EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 APPLICATION

A. Equipment Grounding Conductor Application: Comply with New York City Electrical Code NEC -2014 Article 250 for sizes and quantities of equipment grounding conductors, except where specific types, larger sizes or more conductors are indicated.

1. Use raceway as the equipment ground conductor where feasible and permitted by New York City Electrical Code -2014 for the following:

a. Feeders and branch circuits except as otherwise indicated or as described elsewhere in this Section.
b. Feeders.
c. Lighting circuits.
d. Receptacle circuits.
e. Single-phase motor or appliance branch circuits.
f. Three-phase motor or appliance branch circuits.

B. Signal and Communications: For telephone, alarm, voice and data and other communication systems, provide a #4 AWG minimum green insulated copper conductor in raceway from the grounding electrode system to each service location, antenna terminal cabinet, wiring closet and central equipment location.

C. The ground bus of switchboards switchgear must be connected to the main grounding electrode by means of insulated grounding electrode conductors run in intermediate metallic conduit and sized as per New York City Electrical Code -2014.

D. The main grounding electrode must be an accessible point on the nearest metallic main water service pipe. Connection must be made on the street side of the main valve utilizing a ground clamp of a type specifically manufactured for the purpose. Bonding jumpers must be provided around the water meters (if provided) and around insulating joints and/or sections, utilizing conductors sized as per Code and run in IMC. Bond the structural steel to the grounding electrode system.

E. The water pipe ground must be supplemented by an additional "made" electrode consisting of buried ground rods copper plates laid on 3 inch (75 mm) charcoal bed, and provided in sufficient quantity so as to have a measured resistance to ground of not more than 25 ohms. Establish a bonding connection from the "made" electrode consisting of green insulated conductors run in IMC and sized as per New York City Electrical Code -2014.

F. Bond metallic conduits containing grounding electrode conductors and main bonding conductors to the ground bus service enclosure and/or grounding electrode at both ends of each run utilizing grounding bushings and jumpers. Bonding jumpers must be sized equal to the grounding electrode conductors.

G. Provide grounding bonds for all metallic conduits of the light and power system which terminate at (or in pits below) distribution equipment for which a ground bus is specified. Accomplish this by equipping the conduits with bushings of the grounding type connected individually to the ground bus.

H. Provide supplementary ground bonding to maintain continuity of the equipment and raceway grounding system as follows:

1. Bonding jumpers applied where wiring devices (receptacles and switches) are not equipped with approved self-grounding features. Include any necessary field modifications for termination of the bonding jumpers so as to ensure grounding continuity.
2. Bonding jumpers applied to ensure that grounding continuity does not depend solely on the supporting screws fastening metallic enclosures together.
3. Include any necessary field modifications for termination of the bonding jumpers so as to ensure grounding continuity.

I. Bond the reinforcing bars in concrete to the nearest grounding electrode.

J. The neutral of secondary winding of each low voltage (i.e., less than 600 volts) transformer must be grounded to the grounding electrode as specified hereinafter by means of an insulated grounding conductor sized as per Code and run in IMC. The neutral of each transformer must be bonded to the transformer enclosure by means of an insulated conductor sized as per code. If not factory installed the jumper must be field installed within the transformer enclosure.

K. Where specifically noted on the drawings, or described hereinbefore in this Section, include insulated equipment and raceway grounding conductors run within the raceways. Where insulated equipment grounding conductors required for feeders have not been included in the quantities of conductors indicated on the drawings, incorporate such conductors in accordance with the following table. Adjust conduit sizing if required.

OCD AMPS	GROUNDING CONDUCTOR (CU)
15,20	#12
25-60	#10
70-100	#8
110-200	#4
225-400	*#2
500-600	*2 x #1
700-800	*2 x 1/0
1000	*3 X 2/0
1200	*4 X 3/0
1600	*5 X 4/0
* Adjust quantity (if needed) to match number of conduits in run.	

3.3 INSTALLATION

A. General: Ground electrical systems and equipment according to NFPA 70-2008, as amended by New York City Electrical Code-2014 requirements, except where Drawings or Specifications exceed such requirements.

B. Grounding Conductors: Route along the shortest and straightest paths possible, except as

otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

C. Metal Water Service Pipe: Provide insulated copper grounding conductors, sized as indicated, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes by grounding-clamp connectors. Where a dielectric main water fitting is installed, connect grounding conductor to street side of fitting. Do not install a grounding jumper across dielectric fittings. Bond grounding-conductor conduit to conductor at each end.

D. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with grounding-clamp connectors.

3.4 CONNECTIONS

A. General: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

1. Use electroplated or hot-tin-coated materials to assure high conductivity and to make contact points closer in order of galvanic series.
2. Make connections with clean, bare metal at points of contact.

B. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections, except those at test wells. Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.

C. Equipment Grounding-Wire Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.

D. Noncontact Metal Raceway Terminations: Where metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically noncontinuous conduits at both entrances and exits with grounding bushings and bare grounding conductors, except as otherwise indicated.

E. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. Where these requirements are not available, use those specified in UL 486A and UL 486B.

F. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by manufacturer of connectors. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.

G. Moisture Protection: Where insulated grounding conductors are connected to grounding rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Engage an electrical testing organization to perform tests described below.

B. Tests: Subject the completed grounding system to a Megger test at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal. Measure ground resistance not less than 2 full days after the last trace of precipitation, and without the soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests by the fall-of-potential method according to IEEE 81.

C. Maximum grounding resistance must not exceed 25 ohms.

D. Excessive Ground Resistance: Where resistance to ground exceeds specified values, provide additional grounding to achieve required results.

E. Report: Prepare test reports, certified by the testing organization, of ground resistance at each test location. Include observations of weather and other phenomena that may affect test results.

F. Field Test Reports: Submit written test reports to include the following:

1. Test procedures used.
2. Test results that comply with requirements.
3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

END OF SECTION 26 05 26

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes:
   1. Hangers and supports for electrical equipment and systems.
   2. Construction requirements for concrete bases.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For steel slotted support systems.

B. Shop Drawings: Show fabrication and installation details and include calculations for the following:
   1. Trapeze hangers. Include Product Data for components.
   2. Steel slotted channel systems. Include Product Data for components.
   3. Equipment supports.
   4. Welding certificates.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

C. Comply with NFPA 70 -2008.

1.6 PERFORMANCE REQUIREMENTS

A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.

B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

C. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.7 GUARANTEE

A. Provide a minimum one-year guarantee for hangers and supports from the date of substantial completion.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Allied Tube & Conduit.
      b. Cooper B-Line, Inc.; a division of Cooper Industries.
      c. ERICO International Corporation.
      d. GS Metals Corp.
      e. Thomas & Betts Corporation.
      f. Unistrut; Tyco International, Ltd.
      g. Or approved equal.

B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs must have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body must be malleable iron.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 3APPLICATION

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required and scheduled in NECA 1, where its Table 1 lists maximum spacings less than stated in NFPA 70 - 2008. The minimum rod size must be 1/4 inch in diameter.

3.3 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70 - 2008.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination must be weight of supported components plus 200 lb.

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by 2014 New York City Electrical Code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
6. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69
7. To Light Steel: Sheet metal screws.
8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.

3.4 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.

B. Touchup: Comply with requirements in Section 09 90 00 “Painting and Coating” for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing- paint to restore and comply with ASTM A 780.

END OF SECTION 26 05 29

SECTION 26 05 33 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

B. Related sections

1. Section 07 84 13 “Penetration Firestopping” for firestopping.
2. Section 26 05 29 “Hangers and Supports for Electrical Systems” for raceway and box supports.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Electrical Components, Devices and Accessories: Listed and labeled as defined in NFPA 70-2008, Article 100 and marked for intended use.

C. Comply with NFPA 70-2014, as amended by 2014 New York City Electrical Code.

1.6 DEFINITIONS

A. Rigid Steel Conduit: ANSI C80.1.

B. EMT: Electrical metallic tubing.

C. ENT: Electrical non-metallic tubing.

D. FMC: Flexible metal conduit.

E. IMC: Intermediate metal conduit.

F. LFMC: Liquidtight flexible metallic conduit.

G. RNC: Rigid nonmetallic conduit.

1.7 COORDINATION

A. Coordinate layout and installation of raceways, boxes, enclosures, cabinets and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system and partition assemblies.

1.8 GUARANTEE

A. Provide a minimum one-year guarantee for installation of all raceways and boxes from the date of substantial completion.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

A. Manufacturers: Subject to compliance with requirements, provide by one of the following:

1. Alflex Corp.
2. Grinnell Co./Tyco International; Allied Tube and Conduit Div.
3. LTV Steel Tubular Products Company.
4. Wheatland Tube Co.
5. Triangle PWC, Inc.
6. Or Approved equal.

B. Rigid Steel Conduit: ANSI C80.1

C. IMC: ANSI C80.6.

D. EMT and Fittings: ANSI C80.3.

1. Fittings: Set-screw or compression.

E. FMC: Zinc coated steel.

F. LFMC: Flexible steel conduit with PVC jacket.

G. Fittings: NEMA FB1; compatible with conduit and tubing materials.

H. RNC: NEMA TC 2, Schedule 40 and Schedule 80 PVC.

2.2 METAL WIREWAYS

A. Manufacturers: Subject to compliance with requirements, provide by one of the following:

1. Hoffman.
2. Square D.
3. The Wiremold Company.
4. Or approved equal.

B. Material and Construction: Sheet metal sized and shaped as indicated.

1. Dry locations: NEMA 250, Type1.
2. Damp or Wet locations: NEMA 250, Type 3R.

C. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for a complete system.

D. Select features, unless otherwise indicated, as required to complete wiring system and to comply with NFPA 70-2008.

E. Wireway Covers: Screw-cover type.

F. Finish: Manufacturer's standard enamel finish.

2.3 SURFACE RACEWAYS

A. Surface Metal Raceway: Galvanized steel with snap-on covers. Finish with manufacturer's standard prime coating.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Thomas & Betts Corporation.
b. Walker Systems, Inc; Wiremold Company (The)
c. The Wiremold Co., Electrical Sales Division.
d. Or Approved Equal.

B. Types, sizes and channels as indicated and required for each application, with fittings that match and mate with raceways.

2.4 OPTICAL FIBER/COMMUNICATIONS CABLE RACEWAY AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Arnco Corporation.
2. Endot Industries Inc.
3. IPEX Inc.
4. Lamson & Sessions; Carlon Electrical Products.
5. Or Approved Equal.

B. Description: Comply with UL 2024; flexible type, approved for general-use installation.

2.5 BOXES, ENCLOSURES AND CABINETS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper Crouse-Hinds; Div. Of Cooper Industries, Inc.
2. Emerson/General Signal; Appleton Electric Company.
3. Erickson Electrical Equipment Co.
4. Hoffman.
5. Hubbell, Inc.; Killark Electric Manufacturing Co.
6. O-Z/Gedney; Unit of General Signal.
7. RACO; Division of Hubbell, Inc.
8. Spring City Electrical Manufacturing Co.
9. Thomas & Betts Corporation.
10. Walker Systems Inc.; Wiremold Company (The).
11. Or Approved Equal.

B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.

C. Cast Metal Outlet and Device Boxes: NEMA FB 1, Type FD, with gasketed cover.

D. Nonmetallic Outlet and Device Boxes: NEMA OS 2.

E. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1. Boxes must be sized to in accordance with the New York City Electrical Code- 2014.

F. Cast Metal Pull and Junction Boxes: NEMA FP 1 cast aluminum with gasketed cover. Boxes must be sized to in accordance with the New York City Electrical Code-2014.

G. Cabinets: NEMA 250, Type 1, galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel. Hinged door in front cover with flush latch and associated hinge. Key latch to match panelboards. Include metal barriers to separate wiring of different systems and voltage and include accessory feet where required for freestanding equipment.

H. Pull boxes for Telephone and Signal System Raceways: ANSI/EIA/TIA-569A

2.6 FACTORY FINISHES

A. Finish: For raceway, enclosure, or cabinet components, provide manufacturer's standard prime-coat finish ready for field painting.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 RACEWAY APPLICATION

A. Outdoors: Use the following wiring methods, except as specifically noted otherwise.

1. Exposed: Rigid steel (RGS)
2. Concealed: Rigid steel or IMC.
3. Connection to Vibrating Equipment (including transformers and hydraulic, pneumatic, electric solenoid, or motor driven equipment): LFMC.
4. Boxes and Enclosures: NEMA 250, Type 3R or 4.
5. Underground Conduit: RNC, Sch 80-PVC or RGS encased in concrete.
6. Underground Conduit for Fire Pump: RGS encased in concrete

B. Indoors: Use the following wiring methods:

1. IMC for all purposes and in all applications except where specifically excluded, or where alternative methods are specified below.
2. Normal feeders to fire pump: Rigid steel conduit. Normal feeder conduit encased in 2 inches (5cm) of concrete (or other approved equivalent) where conduits are not physically routed outside the building. Exclude concrete for jockey pumps and/or auxiliary pumps.
3. Utilize EMT for:
   a. Main and submain feeders.
   b. Branch feeders.
   c. Lighting and appliance branch circuitry.
4. Exposed lighting and appliance branch circuitry runs in: Surface metal raceway.
5. See additional requirements relating to wiring methods for control/signal transmission, fire alarm systems, telecommunications, and other communication and alarm system distribution.
6. Wiring methods listed above must be restricted as follows:
   a. Exclude EMT from concrete embedment, from locations where subject to mechanical damage and from exposed locations in finished spaces.
   b. Exclude surface metal raceway from concealed installations, from locations where subject to mechanical damage and from wet or damp locations.
   c. Exclude armored cable from exposed locations and from runs opening into wet or damp locations.
   d. Exclude armored cable (Type AC) from areas of public assembly and all spaces (including voids of walls and ceilings) not separated therefrom by fire rated construction adequate for the purpose.
   e. Utilize only intermediate or rigid steel conduit from runs in (or opening into) hazardous areas. Comply with electric code requirements regarding sealing fittings, boxes, enclosures as appropriate for the conditions of atmospheric contamination.
7. The following must be treated as damp or wet locations within building confines, regardless of whether or not a high ambient moisture level is found to exist:
   a. Spaces where any designations indicating weatherproof (WP) or vaporproof (VP) appear on the drawings.

b. Cooling tower areas.
c. Kitchens up to a height of 18inches (45 cm) above finished floor.
d. Outside of waterproofing in foundation walls in contact with grade.

C. Minimum Raceway Size: 3/4 inch trade size.

D. Indicated Raceway Size: Raceway sizes indicated are based on non-flexible conduit. Where flexible type raceways are specified, increase raceway size as required to maintain code mandated maximum conduit fill.

E. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.

3.3 INSTALLATION

A. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot water pipes. Install horizontal raceway runs above water and steam piping.

B. Complete raceway installation before starting conductor installation.

C. Support raceway as specified in Section 26 05 29 "Hangers and Supports for Electrical Systems".

D. Install temporary closures to prevent foreign matter from entering raceway.

E. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portion of bends is not visible above the finished slab.

F. Make bends and offsets so the inside diameter is not reduced. Unless otherwise indicated, keep the legs of a bend in the same plane and the straight legs of offsets parallel.

G. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.

1. Install concealed raceways with a minimum of bends in the shortest practical distance, considering type of building construction and obstructions, unless otherwise indicated.

H. Install exposed raceways parallel to or at right angles to nearby surfaces or structural members and follow the surface contours as much possible.

1. Run parallel or banked raceways together on common supports.
2. Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.

I. Join raceways with fittings designed and approved for the purpose and make joints tight.

1. Use insulating bushings to protect conductors.

J. Tighten set screws of threadless fittings with suitable tool.

K. Equip all raceways which cross building expansion or control joints, with expansion fittings having flexible grounding bonds bypassing sliding parts.

L. Terminations:

1. Where raceways are terminated with locknuts and bushings, align the raceway to enter squarely, and install the locknuts with dished part against the box. Use two locknuts, one inside and one outside box.
2. Where terminating in threaded hubs, screw the raceway or fitting tight into the hub so the end bears against the wire protection shoulder. Where chase nipples are used, align the raceway so the coupling is square to the box, and tighten the chase nipple so no threads are exposed.

M. Install pull wires in empty raceways. Use No. 14 AWG zinc-coated steel or monofilament plastic line having not less than 200-lb (90 kg) tensile strength. Leave not less than 12 inches (300 mm) of slack at each end of the pull wire.

N. Telephone and Signal System Raceways 2-Inch Trade Size (DN 53) and Smaller: In addition to the above requirements, install in maximum lengths of 100 feet (30 m) and with a maximum of two 90-degree bends or equivalent. Install pull or junction boxes where necessary to comply with these requirements. Pull or junction boxes must be sized in accordance with ANSI/EIA/TIA-569A guidelines.

O. Install raceway sealing fittings according to the manufacturer's written instructions. Locate fittings at suitable, approved, accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points and elsewhere as indicated:

1. Where conduits pass from warm locations to cold locations, such as the boundaries of refrigerated spaces and air-conditioned spaces.
2. Where otherwise required by the NFPA7-2008.

P. Stub-up Connections: Extend conduits through concrete floor for connection to freestanding equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with finished floor. Extend conductors to equipment with rigid steel conduit; FMC may be used 6 inches (150 mm) above the floor. Install screwdriver-operated, threaded plugs flush with floor for future equipment connections.

Q. Flexible Connections: Use maximum of 6 feet (1.8 m) of FMC for recessed and semirecessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use LFMC in wet or damp locations. Install separate ground conductor across flexible connections.

R. Install hinged cover enclosures and cabinets plumb. Support at each corner.

3.4 LOCATING AND ROUTING CIRCUITRY

A. All circuitry must be run concealed except that if must be run exposed as follows:

1. Horizontally at the ceiling of permanently unfinished spaces which are not assigned to mechanical or electrical equipment.
2. Horizontally and vertically in mechanical equipment spaces.
3. Horizontally and vertically in electric equipment rooms.

B. Concealed circuitry must be so located that building construction materials can be applied over its thickest elements without being subject to spalling or cracking.

3.5 INSTALLING JUNCTION, PULL AND OUTLET BOXES

A. Apply junction and pull boxes in accordance with the following:

1. Include pull boxes in long straight runs of raceway to assure that cables are not damaged when they are pulled in.
2. Include junction and pull boxes to assure a neat and workmanlike installation of raceways.
3. Include junction and pull boxes to fulfill requirements pertaining to the limitations to the number of bends permitted in raceway between cable access points, the accessibility of cable joints and splices, and the application of cable supports.
4. Where the wires and cables following the same routing are indicated as running through separate pull boxes, it must be understood that a segregation of the wires and cables is required. Separately indicated pull boxes may be incorporated into single boxes on condition that segregation is maintained by barriers of the type hereinafter specified.
5. Include all required junction and pull boxes regardless of indications on the drawings (which, due to symbolic methods of notation, may omit to show some of them).

B. Apply outlet boxes in accordance with the following:

1. Unless noted below or otherwise specifically indicated, include a separate outlet box for each individual wiring device, lighting fixture and signal or communication system outlet component. Outlet boxes supplied attached to lighting fixtures must not be used as replacements for the boxes specified herein unless they are specifically rated to accept "through circuit" building wires.
2. A continuous row of fixtures of the end-to-end channel type, designed for "through wiring," and wired in accordance with the specifications hereinafter pertaining to circuitry through a series of lighting fixtures, may be supplied through a single outlet box.
3. Multiple local switches indicated at a single location must be gang mounted in a single outlet box.
4. Include all required outlet boxes regardless of indications on the drawings (which due to symbolic methods of notation, may omit to show some of them).
5. Regardless of any indications on the drawings, flush wall mounted outlet boxes must not be set back-to-back in fire rated walls or partitions, even if they are

displaced vertically. Such outlets must be offset horizontally by 24 inches (610mm) or as otherwise required to maintain the fire rating.

6. Flush wall mounted outlet boxes in non-fire rated construction must not be set back-to-back, but must be offset at least 12 inches (30 cm) horizontally regardless of any indication on the drawings.

C. Install junction boxes, pull boxes and outlet boxes in accordance with the following:

1. Exclude surface mounted outlet boxes in conjunction with concealed circuitry.
2. Exclude unused circuitry openings in junction and pull boxes. In larger boxes each such opening must be closed with a galvanized sheet steel plate fastened with a continuous weld all around. In small outlet type boxes, utilize plugs as specified for such boxes.
3. Close up all unused circuitry openings in outlet boxes. Unused openings in cast boxes must be closed with approved cast metal threaded plugs. Unused openings in sheet metal boxes must be closed with sheet metal knock-out plugs.
4. Pack "through the wall" collar type outlet boxes with a sound deadening, non-hardening, non-hygroscopic, non- combustible, high dielectric stuffing material manufactured specifically for the purpose.
5. Outlet boxes for switches must be located at the strike side of doors. Indicated door swings are subject to field change. Outlet boxes must be located on the basis of final door swing arrangements.
6. Boxes and plaster covers for duplex receptacles must be arranged for vertical mounting of the receptacle.
7. Equip outlet boxes used for devices which are connected to wires of systems supplied by more than one set of voltage characteristics with barriers to separate the different systems.

D. Barriers in junction and pull boxes of outlet size must be of the same metal as the box.

E. Barriers in junction and pull boxes which are larger than outlet size must be of polyester resin fiberglass of adequate thickness for mechanical strength but in no case less than 1/4 inch (6.5mm). Each barrier must be mounted, without fastenings, between angle iron guides so that they may be readily removed.

3.6 MOUNTING HEIGHTS

A. Heights of all wall mounted outlets and equipment must be in accordance with the following list. (Dimensions are above finished floor unless noted.)

1. Receptacle or telephone outlet in field constructed wall, partition or column unless otherwise specified below -- 18 inches (45 cm) to centerline.
2. Receptacle or telephone outlet in factory fabricated wall or partition, unless otherwise specified below -- Dimension determined by wall or partition construction.
3. Receptacle or telephone outlet in mechanical spaces, electric switchboard rooms, electric closets -- 60 inches (150 cm) to centerline.
4. Toggle switch outlet in field constructed wall partition or column -- 46 inches (117 cm) to centerline.
5. Toggle switch outlet in factory fabricated wall or partition -- Dimension

determined by wall or partition construction.

6. Bracket lighting outlets, except for "over door" -- 90 inches (228 cm) to centerline.
7. Bracket lighting outlet over door -- as required to center outlet between top surface of door lintel and underside of ceiling.
8. Wall exit sign except for over door -- 90 inches (228 cm) to centerline.
9. Exit sign over door -- As required to center sign between top surface of door lintel and underside of ceiling.
10. Outlet for any signal system device other than fire alarm station requiring manual operation – 46 inches (117 cm) to centerline.
11. Manual fire alarm station -- 46 inches (117 cm) to centerline.
12. Outlet for any signal system visual or sounding device other than fire alarm visual device or visual/sounding device -- As required for device to clear underside of ceiling by 1 inch (25 mm).
13. Outlet for fire alarm visual device -- Visual device 80 inches (203 cm) AFF, except as otherwise noted.
14. Clock outlet -- As required for clock to clear underside of ceiling by 1 inch (25 mm).

B. Architectural drawings and field instructions issued by the Commissioner take precedence over the above list and must be adhered to.

3.7 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, to ensure that coatings, finishes, and cabinets are without damage or deterioration at substantial completion.

1. Restore damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Restore damage to PVC or paint finishes with matching touch-up coating recommended by the manufacturer.

3.8 CLEANING

A. After completing installation of exposed, factory-finished raceways and boxes, inspect exposed finishes and restore damaged finishes.

END OF SECTION 26 05 33

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes electrical identification materials and devices required to comply with ANSI C2, NFPA 70-2008, NYC Electrical Code-2014, OSHA standards.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each electrical identification product indicated.

B. Schedule of Nomenclature: An index of electrical equipment and system components used in identification signs and labels.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Comply with NFPA 70-2008 and NYC Electrical Code - 2014.

C. Comply with ANSI A13.1 and NFPA 70 - 2008 for color-coding.

D. Comply with ANSI Z535-4 and NFPA 70E - 2008.

1.6 WARRANTY

A. Provide a minimum one-year warranty by manufacturer for material and workmanship for installation of all identification from the date of substantial completion.

PART 2 - PRODUCTS

2.1 RACEWAY AND CABLE LABELS

A. Comply with ANSI A13.1, Table 3, for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

1. Color: Black letters on orange field.
2. Legend: Indicates voltage and service.

B. Adhesive Labels: Preprinted, flexible, self-adhesive vinyl with legend over laminated with a clear, weather- and chemical-resistant coating.

C. Pretensioned, Wraparound Plastic Sleeves: Flexible, preprinted, color-coded, acrylic band sized to suit the diameter of the line it identifies and arranged to stay in place by pretensioned gripping action when placed in position.

D. Colored Adhesive Tape: Self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

E. Tape Markers: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.

F. Aluminum, Wraparound Marker Bands: Bands cut from 0.014-inch thick aluminum sheet, with stamped or embossed legend, and fitted with slots or ears for permanently securing around wire or cable jacket or around groups of conductors.

G. Plasticized Card-Stock Tags: Vinyl cloth with preprinted and field-printed legends. Orange background, unless otherwise indicated, with eyelet for fastener.

H. Aluminum-Faced, Card-Stock Tags: Weather-resistant, 18-point minimum card stock faced on both sides with embossable aluminum sheet, 0.002 inch thick, laminated with moisture-resistant acrylic adhesive, punched for fasteners, and preprinted with legends to suit each application.

I. Brass or Aluminum Tags: 2 by 2 by 0.05-inch metal tags with stamped legend, punched for fastener.

2.2 NAMEPLATES AND SIGNS

A. Safety Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145.

B. Engraved Plastic Nameplates and Signs: Engraving stock, melamine plastic laminate, minimum 1/16 inch thick for signs up to 20 sq. in. and 1/8 inch thick for larger sizes.

1. Engraved legend with black letters on white face.
2. Punched or drilled for mechanical fasteners.

C. Baked-Enamel Signs for Interior Use: Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for the application. 1/4-inch grommets in corners for mounting.

D. Exterior, Metal-Backed, Butyrate Signs: Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for the application. 1/4-inch grommets in corners for mounting.

E. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32, stainless-steel machine screws with nuts and flat and lock washers.

2.3 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Cable Ties: Fungus-inert, self-extinguishing, one-piece, self-locking, Type 6/6 nylon cable ties.

1. Minimum Width: 3/16 inch.
2. Tensile Strength: 50 lb minimum.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: According to color-coding.

B. Paint: Formulated for the type of surface and intended use.

1. Primer for Galvanized Metal: Single-component acrylic vehicle formulated for galvanized surfaces.
2. Primer for Concrete Masonry Units: Heavy-duty-resin block filler.
3. Primer for Concrete: Clear, alkali-resistant, binder-type sealer.
4. Enamel: Silicone-alkyd or alkyd urethane as recommended by primer manufacturer.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Identification Materials and Devices: Install at locations for most convenient viewing without interference with operation and maintenance of equipment.

B. Lettering, Colors, and Graphics: Coordinate names, abbreviations, colors, and other designations with corresponding designations in the Contract Documents or with those required by codes and standards. Use consistent designations throughout Project.

C. Sequence of Work: If identification is applied to surfaces that require finish, install identification after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before applying.

E. Install painted identification according to manufacturer's written instructions and as follows:

1. Clean surfaces of dust, loose material, and oily films before painting.
2. Prime surfaces using type of primer specified for surface.

F. Color Banding Raceways and Exposed Cables: Band exposed and accessible raceways of the systems listed below:

1. Bands: Pretensioned, wraparound plastic sleeves; colored adhesive tape; or a combination of both. Make each color band 2 inches wide, completely encircling conduit.

2. Band Locations: At changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

3. Apply the following colors to the systems listed below:

a. Fire Alarm System: Red.

G. Caution Labels for Indoor Boxes and Enclosures for Power and Lighting: Install pressure-sensitive, self-adhesive labels identifying system voltage with black letters on orange background. Install on exterior of door or cover.

H. Secondary Service, Feeder, and Branch-Circuit Conductors: Color-code throughout the secondary electrical system.

1. Color-code 208/120-V system as follows:

a. Phase A: Black.
b. Phase B: Red.
c. Phase C: Blue.

d. Neutral: White.
e. Ground: Green.

2. Factory apply color the entire length of conductors, except the following field-applied, color-coding methods may be used instead of factory-coded wire for sizes larger than No. 10 AWG:

a. Colored, pressure-sensitive plastic tape in half-lapped turns for a distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Use 1-inch wide tape in colors specified. Adjust tape bands to avoid obscuring cable identification markings.

b. Colored cable ties applied in groups of three ties of specified color to each wire at each terminal or splice point starting 3 inches from the terminal and spaced 3 inches apart. Apply with a special tool or pliers, tighten to a snug fit, and cut off excess length.

I. Medium Voltage Service Conductors: Color-code throughout the medium voltage system.

1. Color-code 4160V system as follows:

a. Phase A: Black.
b. Phase B: Red.
c. Phase C: Blue.
d. Neutral: White.
e. Ground: Green.

J. Power Circuit Identification: Separately identify each power circuit, cable or feeder at each termination, and at each pull box, junction box, vault and manhole through which it passes.

1. Non-ferrous metallic tags or wrap-around bands for outdoor or underground use.

2. Plasticized card stock tags or wrap-around labels for indoor use.

3. Stamped or embossed letters (1/4" high) identifying feeder or circuit by number and origin.

K. Apply warning, caution, and instruction signs as follows:

1. Warnings, Cautions, and Instructions: Install to ensure safe operation and maintenance of electrical systems and of items to which they connect. Include as a minimum warnings of Arc-Flash hazards and identification of series-rated devices. Install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.

L. Equipment Identification Labels: Engraved plastic laminate. Install each unit of equipment, including central or master unit of each system. This includes power, lighting, communication, signal, and alarm systems, unless units are specified with their own self-explanatory identification. Unless otherwise indicated, provide a single line of text with ½-inch- high lettering on 1-1/2-inch- high label; where two lines of text are required, use labels 2 inches high. Use white lettering on black field. Apply labels for each unit of the following categories of equipment using mechanical fasteners:

1. Panelboards, electrical cabinets, and enclosures.
2. Access doors and panels for concealed electrical items.
3. Switchboards.
4. Electrical substations.
5. Emergency system boxes and enclosures.
6. Disconnect switches.
7. Motor starters.
8. Transfer switches.
9. Contactors
10. Dimmers.
11. Control devices.
12. Fire alarm master station or control panel.
13. Device wall plates
14. Lighting Control Panels
15. Fire Alarm Pull Boxes
16. Fire Alarm Remote Smoke Detectors
17. All other Fire Alarm Devices
18. Lamps
19. Luminaires

END OF SECTION 26 05 53

SECTION 26 05 73 – POWER SYSTEM STUDIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section includes computer-based, overcurrent protective device coordination studies to determine overcurrent protective devices and to determine overcurrent protective device settings for selective tripping.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For computer software program to be used for studies.

B. Other Action Submittals: Submit the following after the approval of system protective devices submittals. Submittals may be in digital form.

1. Coordination-study input data, including completed computer program input data sheets.
2. Study and equipment evaluation reports.
3. Overcurrent protective device coordination study report; signed, dated, and sealed by a qualified professional engineer licensed in State of New York.

    a. Submit study report for action prior to receiving final approval of the distribution equipment submittals. If formal completion of studies will cause delay in equipment manufacturing, obtain approval from Commissioner for preliminary submittal of sufficient study data to ensure that the selection of devices and associated characteristics is satisfactory.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Coordination Study Specialist.

B. Product Certificates: For overcurrent protective device coordination study software, certifying compliance with IEEE 399.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For the overcurrent protective devices to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in DDC General Conditions, include the following:

a. The following parts from the Protective Device Coordination Study Report:

1) One-line diagram.
2) Protective device coordination study.
3) Time-current coordination curves.

b. Power system data.

1.7 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with the requirements of standards and guides specified in this Section. Manual calculations are unacceptable.

C. Coordination Study Software Developer Qualifications: An entity that owns and markets computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.

1. The computer program shall be developed under the charge of a licensed professional engineer who holds IEEE Computer Society's Certified Software Development Professional certification.

D. Coordination Study Specialist Qualifications: Professional engineer in charge of performing the study and documenting recommendations, licensed in the State of New York. All elements of the study shall be performed under the direct supervision and control of this professional engineer.

E. Field Adjusting Agency Qualifications: An independent agency, with the experience and capability to adjust overcurrent devices and to conduct the testing indicated, that is a member company of the International Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7.

PART 2 - PRODUCTS

2.1 COMPUTER SOFTWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. ESA Inc.

2. Operation Technology, Inc.
3. Power Analytics, Corporation.
4. SKM Systems Analysis, Inc.
5. Approved Equal

B. Comply with IEEE 242 and IEEE 399.

C. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output. Computer software program shall report device settings and ratings of all overcurrent protective devices and shall demonstrate selective coordination by computer-generated, time-current coordination plots.

2.2 PROTECTIVE DEVICE COORDINATION STUDY REPORT CONTENTS

A. Executive summary.

B. Study descriptions, purpose, basis and scope. Include case descriptions, definition of terms and guide for interpretation of the computer printout.

C. One-line diagram, showing the following:

1. Protective device designations and ampere ratings.
2. Cable size and lengths.
3. Motor and generator designations and kVA ratings.
4. Switchgear, switchboard, motor-control center, and panelboard designations.

D. Study Input Data: As described in "Power System Data" Article.

E. Short-Circuit Study:

1. Low-Voltage Fault Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:

a. Voltage.
b. Calculated fault-current magnitude and angle.
c. Fault-point X/R ratio.
d. Equivalent impedance.

2. Momentary Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:

a. Voltage.
b. Calculated symmetrical fault-current magnitude and angle.
c. Fault-point X/R ratio.
d. Calculated asymmetrical fault currents:

1) Based on fault-point X/R ratio.
2) Based on calculated symmetrical value multiplied by 1.6.
3) Based on calculated symmetrical value multiplied by 2.7.

3. Interrupting Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:

    a. Voltage.
    b. Calculated symmetrical fault-current magnitude and angle.
    c. Fault-point X/R ratio.
    d. No AC Decrement (NACD) ratio.
    e. Equivalent impedance.
    f. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a symmetrical basis.
    g. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a total basis.

F. Protective Device Coordination Study:

1. Report recommended settings of protective devices, ready to be applied in the field. Use manufacturer's data sheets for recording the recommended setting of overcurrent protective devices when available.

    a. Phase and Ground Relays:

        1) Device tag.
        2) Relay current transformer ratio and tap, time dial, and instantaneous pickup value.
        3) Recommendations on improved relaying systems, if applicable.

    b. Circuit Breakers:

        1) Adjustable pickups and time delays (long time, short time, ground).
        2) Adjustable time-current characteristic.
        3) Adjustable instantaneous pickup.
        4) Recommendations on improved trip systems, if applicable.

    c. Fuses: Show current rating, voltage, and class.

G. Time-Current Coordination Curves: Determine settings of overcurrent protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between devices installed in series, including power utility company's upstream devices. Prepare separate sets of curves for the switching schemes and for emergency periods where the power source is local generation. Show the following information:

1. Device tag and title, one-line diagram with legend identifying the portion of the system covered.
2. Terminate device characteristic curves at a point reflecting maximum symmetrical or asymmetrical fault current to which the device is exposed.
3. Identify the device associated with each curve by manufacturer type, function, and, if applicable, tap, time delay, and instantaneous settings recommended.
4. Plot the following listed characteristic curves, as applicable:

    a. Power utility's overcurrent protective device.
    b. Low-voltage fuses including manufacturer's minimum melt, total clearing, tolerance, and damage bands.

c. Low-voltage equipment circuit-breaker trip devices, including manufacturer's tolerance bands.
d. Transformer full-load current, magnetizing inrush current.
e. Ground-fault protective devices.
f. The largest feeder circuit breaker in each motor-control center and panelboard.

5. Provide adequate time margins between device characteristics such that selective operation is achieved.
6. Comments and recommendations for system improvements.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine Project overcurrent protective device submittals for compliance with electrical distribution system coordination requirements and other conditions affecting performance. Devices to be coordinated are indicated on Drawings.

1. Proceed with coordination study only after relevant equipment submittals have been assembled. Overcurrent protective devices that have not been submitted and approved prior to coordination study may not be used in study.

3.3 PROTECTIVE DEVICE COORDINATION STUDY

A. Comply with IEEE 242 for calculating short-circuit currents and determining coordination time intervals.

B. Comply with IEEE 399 for general study procedures.

C. The study shall be based on the device characteristics supplied by device manufacturer.

D. Begin analysis at the service, extending down to the system overcurrent protective devices as follows:

1. To normal system low-voltage load buses where fault current is 10 kA or less.

E. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project. Study all cases of system-switching configurations and alternate operations that could result in maximum fault conditions.

F. The calculations shall include the ac fault-current decay from induction motors. The calculations shall also account for the fault-current dc decrement, to address the asymmetrical requirements of the interrupting equipment.

1. For grounded systems, provide a bolted line-to-ground fault-current study for areas as defined for the three-phase bolted fault short-circuit study.

G. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault and single line-to-ground fault at each of the following:

1. Electric utility's supply termination point.
2. Switchgear.
3. Low-voltage switchgear.
4. Motor-control centers.
5. Standby generators and automatic transfer switches.
6. Branch circuit panelboards.

H. Protective Device Evaluation:

1. Evaluate equipment and protective devices and compare to short-circuit ratings.
2. Adequacy of switchgear, motor-control centers, and panelboard bus bars to withstand short-circuit stresses.

3.4 POWER SYSTEM DATA

A. Obtain all data necessary for the conduct of the overcurrent protective device study.

1. Verify completeness of data supplied in the one-line diagram on Drawings. Call discrepancies to the attention of Commissioner.
2. Use characteristics submitted under the provisions of action submittals and information submittals for this Project.

B. Gather and tabulate the following input data to support coordination study. The list below is a guide.

1. Product Data for overcurrent protective devices specified in other Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.
2. Electrical power utility impedance at the service.
3. Power sources and ties.
4. Short-circuit current at each system bus, three phase and line-to-ground.
5. Full-load current of all loads.
6. Voltage level at each bus.
7. For transformers, include kVA, primary and secondary voltages, connection type, impedance, X/R ratio, taps measured in percent, and phase shift.
8. For circuit breakers and fuses, provide manufacturer and model designation. List type of breaker, type of trip and available range of settings, SCCR, current rating, and breaker settings.
9. Maximum demands from service meters.
10. Busway manufacturer and model designation, current rating, impedance, lengths, and conductor material.
11. Motor horsepower and NEMA MG 1 code letter designation.

12. Low-voltage cable sizes, lengths, number, conductor material, and conduit material (magnetic or nonmagnetic).
13. Data sheets to supplement electrical distribution system diagram, cross-referenced with tag numbers on diagram, showing the following:

    a. Special load considerations, including starting inrush currents and frequent starting and stopping.
    b. Ratings, types, and settings of utility company's overcurrent protective devices.
    c. Special overcurrent protective device settings or types stipulated by utility company.
    d. Time-current-characteristic curves of devices indicated to be coordinated.
    e. Manufacturer, frame size, interrupting rating in amperes rms symmetrical, ampere or current sensor rating, long-time adjustment range, short-time adjustment range, and instantaneous adjustment range for circuit breakers.
    f. Manufacturer and type, ampere-tap adjustment range, time-delay adjustment range, instantaneous attachment adjustment range, and current transformer ratio for overcurrent relays.
    g. Panelboards, switchboards, motor-control center ampacity, and SCCR in amperes rms symmetrical.

3.5 FIELD ADJUSTING

A. Adjust relay and protective device settings according to the recommended settings provided by the coordination study. Field adjustments shall be completed by the engineering service division of the equipment manufacturer under the Startup and Acceptance Testing contract portion.

3.6 DEMONSTRATION

A. Engage the Coordination Study Specialist to instruct the City of New York’s staff in the following:

    1. Fundamentals of operating the power system in normal and emergency modes.
    2. Hand-out and explain the objectives of the coordination study, study descriptions, purpose, basis, and scope. Include case descriptions, definition of terms, and guide for interpreting the time-current coordination curves.
    3. Adjust, operate, and maintain overcurrent protective device settings.

END OF SECTION 26 05 73

THIS PAGE LEFT INTENTIONALLY BLANK

SECTION 26 08 00 COMMISSIONING OF ELECTRICAL SYSTEMS

PART I – GENERAL

1.1. RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2. SUMMARY

A. Commissioning consists of systematically documenting that specified components and systems have been installed and started up properly and then functionally tested to verify and document proper operation through all sequences of operation and conditions. In addition, instruction of the City of New York's operations personnel must be verified and final project O&M Documents must be reviewed for completeness.

1.3. QUALITY ASSURANCE

A. Reference Standards:
1. OSHA Part 1910; Subpart S. 1910.308.
2. American National Standards Institute: ANSI
3. American Society for Testing and Materials: ASTM
4. Association of Edison Illuminating Companies: AEIC
5. Institute of Electrical and Electronics Engineers: IEEE
6. Insulated Cable Engineers Association: ICEA
7. National Electrical Manufacturers Association: NEMA
8. InterNational Electrical Testing Association: NETA
9. National Fire Protection Association (NFPA): NFPA
10. National Electrical Code (NEC).

B. All inspections and tests must use the following references.
1. Contract Specifications.
2. Contract Drawings.
3. Manufacturer's instruction manuals and approved shop drawings for applicable equipment.
4. InterNational Electrical Testing Association (NETA) Standards for Electrical Power Equipment and Systems.
   a. NETA ATS (Acceptance testing specifications)
   b. NETA ECS (Electrical commissioning specifications)
   c. NETA ETT (Electrical testing technicians)
   d. NETA MTS (Maintenance testing specifications)

PART II – PRODUCTS

2.1. EQUIPMENT AND INSTRUMENTS FOR Cx PROCESS

A. The Contractor must furnish all tools, instruments, laptops, calibrated meters, software programs, personnel, and services required to perform the commissioning process. This includes providing the connection to systems to be tested, temporary alterations for test purposes, calibrations, operation of the test equipment & instrumentation and generating test results (as required), and the restoration of equipment/systems to original operating condition. A list of all tools and equipment to be used during commissioning must be submitted to the CxA for approval. The Contractor must furnish necessary utilities for the commissioning process.

B. Proprietary test equipment and software required by any equipment manufacturer for programming and/or start-up, whether specified or not, must be provided by the manufacturer of the equipment. Proprietary test equipment (and software) must become the property of the City of New York upon completion of the commissioning process.

2.2. COMMISSIONING DOCUMENTATION

A. All documentation for the commissioning process must be entered into the CxA's commissioning project progress tracking software tool. The Contractor must be allowed web-based access to the software upon request. Additionally, the Contractor may download the CxA's mobile application to a tablet format. The mobile application is available in Apple, Android, and Windows format. There is no fee associated with the software or the mobile application. The Contractor must allow sufficient time to familiarize themselves with the operation of the software.

PART III – EXECUTION

3.1. GENERAL

A. The Contractor must complete all phases of work so the systems can be started, tested, balanced, and acceptance procedures undertaken. This includes the complete installation of all equipment, materials, pipe, duct, wire, insulation, controls, etc., per the Contract Documents and related directives, clarifications, and change orders.

3.2. PARTICIPATION IN ACCEPTANCE PROCEDURES

A. The Contractor must provide skilled technicians to startup and debug all systems within the project contracted work. These same technicians must be made available to assist the CxA in completing the commissioning program. Work schedules, time required for testing, etc., must be requested by the CxA and coordinated by the Contractor. The Contractor must ensure that the qualified technician(s) are available and present during the agreed upon schedules and of sufficient duration to complete the necessary tests, adjustments, and/or problem resolutions.

B. System performance problems and discrepancies may require additional technician time, CxA time, reconstruction of systems, and/or replacement of system components. At no additional cost to the City of New York, the additional technician time must be made available for subsequent commissioning periods until the required system performance is obtained.

C. The CxA reserves the right to question the appropriateness and qualifications of the technicians relative to each item of equipment, system, and/or sub-system. Qualifications of technicians must include expert knowledge relative to the specific equipment involved and willingness to work with the CxA. The Contractor must provide adequate documentation and tools to start-up and test the equipment, system, and/or sub-system.

3.3. DEFICIENCY RESOLUTION

A. In some systems, inaccurate adjustments, misapplied equipment, and/or deficient performance under varying loads must result in additional work being required to commission the systems. This work must be completed under the direction of the Commissioner, with input from the Contractor, equipment supplier, and CxA. Whereas all members must have input and the opportunity to discuss, debate, and work out problems, the Commissioner must have final jurisdiction over any additional work done to achieve performance.

B. Corrective work must be completed in a timely fashion to permit the completion of the commissioning process. Experimentation to demonstrate system performance may be permitted. If the CxA deems the experimentation work to be ineffective or untimely as it relates to the commissioning process, the CxA must notify the Commissioner, indicating the nature of the problem, expected steps to be taken, and suggested deadline(s) for completion of activities. If the deadline(s) pass without resolution of the problem, the Commissioner reserves the right to obtain supplementary services and/or equipment to resolve the problem. The Contractor must provide supplementary services incurred to solve problems at no additional cost to the City of New York.

3.4. ADDITIONAL COMMISSIONING

A. Additional commissioning activities may be required after system adjustments, replacements, etc., are completed. The Contractor, suppliers, and CxA must complete this work at no additional cost to the City of New York.

3.5. SUSTAINING SYSTEM READINESS

A. The CxA must prepare and issue to the Contractor Pre-Functional Checklist (PFC) forms for each system or major piece of equipment to be commissioned. Pre-Functional Checklists are important to ensure that the equipment and systems are installed and operational. It ensures that Functional Performance and Integrated Systems Testing may proceed without unnecessary delays. Each piece of equipment is to receive full pre-functional checkout by the Contractor. No sampling strategies are to be used. The Pre-Functional Checklists for all equipment related to any given system must be successfully completed prior to formal Functional Performance and Integrated Systems Testing of the system.

B. The CxA must monitor and track the completion of the Pre-Functional Checklist forms.

C. The Contractor must complete the Pre-Functional Checklists, provided by the CxA, as follows:

1. Pre-Functional Checklists should be maintained in a binder(s) or electronically at the Contractor's project site office and are subject to review for comparison between the completion level of the Checklists and the status of the work during site observation visits by the CxA.

3. Complete Section 1 "Equipment Delivery" of the Pre-Functional Checklist after equipment delivery to the site.

4. Complete Section 2 "Equipment Installation" of the Pre-Functional Checklist after the equipment installation is complete.

5. Complete Section 3 "Equipment Start-up" of the Pre-Functional Checklist after the equipment has been successfully started. The Contractor is to forward copies of all manufacturer's start-up forms and reports to the CxA.

6. Complete Section 4 "SCADA/Power Monitoring/Lighting Control Integration" of the Pre-Functional Checklist after the equipment and systems control configuration and integration process has been completed.

7. Complete Section 5 "Notification for Testing" of the Pre-Functional Checklist after the equipment if fully operational and ready for Functional Performance and Integrated Systems Testing.

8. Completed and signed Pre-Functional Checklists are a pre-requisite for commencing Functional Performance and Integrated Systems Testing. If field observation indicates a significant deviation from actual installation conditions, all checklists must be returned to the Contractor for revision and resubmission at no additional cost to the City.

9. Only individuals that have direct knowledge and witnessed that a line item task on the Pre-Functional Checklist was actually performed must initial or check off that item.

D. The Contractor must clearly list any outstanding items from the Pre-Functional Checklists and/or manufacturer start-up reports and checklists that were not completed successfully in the Comments section of the applicable Pre-Functional Checklist. The CxA must review any items/issues listed and must address them through discussion with the Commissioner and Contractor prior to proceeding with Functional Performance and Integrated Systems Testing.

E. The Contractor must develop detailed start-up plans for all equipment. These plans must be reviewed by the Commissioner and the CxA for completeness and verification that the manufacturer-recommended procedures have been completed.

1. The Contractor responsible for the installation and start-up of the equipment is responsible for developing the start-up plan by combining the Pre-Functional Checklist with the manufacturer's detailed start-up and checkout procedures and any required quality assurance testing.

2. The Contractor must maintain an updated and annotated copy of the start-up plan that must be accessible for review by the Commissioner and the CxA at periodic intervals.

3. The completed start-up procedures must be provided along with the completed Pre-Functional Checklists to the CxA prior to the Contractor's certification that the systems are ready for Functional Performance and Integrated Systems Testing.

3.6. FUNCTIONAL PERFORMANCE TESTING

A. The CxA must provide to the Contractor functional performance tests (FPTs). The Contractor must review the test procedures, so that proper preparation may occur. The Contractor must execute the FPT document and prove to the Commissioner and the CxA that the performance of the Electrical Systems achieves the performance level identified. Refer to all other specification sections for other systems that may need to be tested. The following systems are to be commissioned but not limited to:

1. Electrical Systems:

   a. Electrical Panels

   b. UPS

   c. Lighting Controls

B. Detailed testing must be performed on all installed equipment and systems to ensure that operation and performance conform to the Contract Documents. All tests must be witnessed by the CxA. The following testing is required as part of the commissioning process:

1. Verification tests are comprised of a full range of checks and tests to determine that all components, equipment, systems, and interfaces between systems operate in accordance with contract documents. This includes all operating modes, interlocks, control responses, and specific responses to abnormal or emergency conditions.

2. Functional performance tests (FPT) must determine if the electrical system is in accordance with the finalized design intent.

3.7. ROLES AND RESPONSIBILITIES

A. Contractor

1. Assure acceptable representation, with the means and authority to prepare and coordinate execution of the electrical system commissioning program as described in the Contract Documents.
2. Attend commissioning meetings scheduled by the CxA.
3. Coordinate inclusion of commissioning activities in the construction schedule.
4. Complete Pre-Functional Checklists and manufacturer's pre-startup checklists prior to scheduling pre-testing of the electrical system.
5. Issue a notice that electrical pre-testing has been scheduled.
6. Monitor, respond, and remedy deficiencies identified in the Corrective Issue Reports (CIRs) distributed by the CxA in order to expedite corrective actions necessary to achieve design intent.
7. Facilitate resolution of deficiencies that were identified by observations or performance testing.
8. Participate in the Functional Performance Tests as required to achieve design intent.
9. Participate in O&M Instruction as required by DDC General Conditions Section 017900, Demonstration and Owner's Pre-Acceptance Orientation and 019113, General Commissioning Requirements for MEP Systems.
10. Include requirements for submittal data, O & M data, and instruction in each purchase order or sub-contract written.
11. Ensure participation of major equipment manufacturers in appropriate instruction and testing activities.
12. Attend Construction Phase coordination meeting scheduled by the CxA.
13. Assist the CxA in all verification and functional performance tests.
14. Prepare preliminary schedule and include the following tasks that must be executed: electrical system orientation and inspections, O&M manual submission, instruction sessions, NETA testing, equipment start-up, and task completion for use by the CxA. Update schedule as appropriate throughout the construction period.
15. Attend initial instruction session.
16. Conduct electrical system orientation and inspection at the equipment placement completion stage.
17. Update drawings to the record condition to date, and review with the CxA.
18. Gather O&M data on all equipment, and assemble in binders as required by DDC General Conditions Section 017830, Contract Record Documents and Section 019113, General Commissioning Requirements for MEP Systems.
19. Notify the CxA a minimum of two weeks in advance, so that witnessing equipment and system start-up and testing can begin.

20. Notify the CxA a minimum of two weeks in advance, of the time for start of the initial energization.
21. Participate in and schedule vendors to participate in the instruction sessions.
22. Provide written notification to the CxA that the following work has been completed in accordance with the Contract Documents, and that the equipment, systems, and sub-systems are operating as required.
    a. Electrical equipment and all contracted equipment.
    b. Dedicated and Non-dedicated systems using the air handling units for smoke control.
    c. Fire detection and smoke detection devices furnished under other divisions of this specification as they affect the operation of the smoke control systems.
    d. Control systems (SCADA) that control electrical equipment are functioning.
    e. Provide a complete set of as-built records to the CxA.

3.8. STARTUP

A. The Contractor must follow the start-up and initial checkout procedures listed in this specification and in DDC General Conditions Section 017839, Contract Record Documents and Section 019113, General Commissioning Requirements for MEP Systems. The Division 26 subcontractor, under the direction of the Contractor, has start-up responsibility and is required to complete systems and sub-systems so that they are fully functional and meet the design objectives of the Contract Documents. The commissioning procedures and functional testing do not relieve, lessen this responsibility, or shift that responsibility partially to the CxA or the City of New York.

B. Functional testing is intended to begin upon completion of a system. Functional testing may proceed prior to the completion of systems, or sub-systems at the discretion of the CxA and the Contractor. Beginning system testing before full completion does not relieve the Contractor from fully completing the system, including all Pre-Functional Checklists as soon as possible.

3.9. COMMISSIONING STATUS TRACKING

A. The Contractor must verify that the tag designation as well as the number (count) of each unit listed is correct against those contained within the Contract Documents.

END OF SECTION 26 08 00

SECTION 26 09 23 - LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes a networked lighting control system comprised of the following components:

1. System Software Interfaces
   a. Management Interface
   b. Visualization Interface
2. System Backbone and Integration Equipment
   a. System Controller
   b. Digital Time Clock
3. Wired Networked Devices
   a. Wall Stations
   b. Graphic Wall Stations
   c. Digital Key Switches
   d. Auxiliary Input/Output Devices
   e. Occupancy and Photocell Sensors
   f. Wall Switch Sensors
   g. Embedded Sensors
   h. Power Packs and Secondary Packs
   i. Networked Luminaires
   j. Relay and Dimming Panel
   k. Bluetooth Low Energy Programming Device
   l. Communication Bridge

B. Related Sections:

1. Section 26 27 26 " Wiring Devices" for wiring.

C. The networked lighting control system must meet all the characteristics and performance requirements specified herein.

D. The contractor must provide, install and verify proper operation of all equipment necessary for proper operation of the system as specified herein and as shown on applicable drawings.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 SUBMITTALS

A. Submittal must be provided including the following items.

1. Bill of Materials necessary to install the networked lighting control system.
2. Product Specification Sheets indicating general device descriptions, dimensions, electrical specifications, wiring details, and nomenclature.
3. Riser Diagrams showing device wiring connections of system backbone and typical per room/area type.
4. Information Technology (IT) connection information pertaining to interconnection with facility IT networking equipment and third-party systems.
5. Other Diagrams and Operational Descriptions – as needed to indicate system operation or interaction with other system(s).
6. Contractor Startup/Testing Worksheet must be completed prior to factory start-up.
7. Hardware and Software Operation Manuals.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Product Qualifications

1. System electrical components must be listed or recognized by a nationally recognized testing laboratory (e.g., UL, ETL, or CSA) and must be labeled with required markings as applicable.
2. System luminaires and controls are certified by manufacturer to have been designed, manufactured and tested for interoperability.
3. All components must be subjected to 100% end of line testing prior to shipment to the project site to ensure proper device operation.
4. All components and the manufacturing facility where product is manufactured must be RoHS compliant.

C. Installation and Startup Qualifications

1. System startup must be performed by qualified personnel properly trained by the manufacturer.

1.6 PROJECT CONDITIONS

A. Only install indoor equipment after the following site conditions are maintained:

1. Ambient Temperature: 14 to 105 degrees F (-10 to 40 degrees C)
2. Relative Humidity: less than 90% non-condensing

B. Equipment must not be subjected to dust, debris, moisture, or temperature and humidity conditions exceeding the requirements indicated above or as marked on the product, at any point prior to installation.

C. Only properly rated equipment and enclosures, installed per the manufacturer's instructions, may be subjected to dust and moisture following installation.

1.7 WARRANTY

A. The manufacturer must provide a minimum five-year warranty on all hardware devices supplied and installed. Warranty coverage must begin form date of substantial completion.

B. The hardware warranty must cover restoration of any defective products within the warranty period.

C. The manufacturer must make available new parts, upgrades, and/or replacements available for a minimum of 5 years following substantial completion.

PART 2 - EQUIPMENT

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Acuity Brands Lighting, Inc.
2. Lutron
3. Watt Stopper
4. Or Approved equal

2.2 SYSTEM COMPLIANCE

A. System components must comply with UL 916 and UL 924 standards where applicable.

B. System components must comply with CFR Title 47, Part 15 standards where applicable.

C. System components must comply with ISED Canada RSS-247 standards where applicable.

D. All equipment must be installed and connected in compliance with NFPA 70-2008.

2.3 SYSTEM PERFORMANCE REQUIREMENTS

A. System Architecture

1. System must have an architecture that is based upon three main concepts:
   a. Networkable intelligent lighting control devices,
   b. Standalone lighting control zones using distributed intelligence,
   c. Optional system backbone for remote, time based and global operation.
2. Intelligent lighting control devices must have individually addressable network communication capability and consist of one or more basic lighting control components: occupancy sensor, photocell sensor, relay, dimming output, contact closure input, analog 0-10V input, and manual wall station capable of indicating switching, dimming, and/or

scene control. Combining one or more of these components into a single device enclosure must be permissible so as to minimize overall device count of system.

3. System must be capable of interfacing directly with networked luminaires such that either low voltage network cabling or wireless RF communication is used to interconnect networked luminaires with control components such as sensors, switches and system backbone (see "Control Zone Characteristics" sections for each type of network connection, wired or wireless).

4. Networked luminaires and intelligent lighting control devices must support unique configuration of device settings and properties, with such configuration residing within the networked luminaires and intelligent control devices.

5. Lighting control zones consisting of one or more networked luminaires and intelligent lighting control devices and must be capable of providing automatic control from sensors (occupancy and/or photocell) and manual control from local wall stations without requiring connection to a higher-level system backbone; this capability is referred to as "distributed intelligence."
   a. Lighting control zones of at least 128 devices per zone must be supported.

6. Networked luminaires and intelligent lighting control devices must have distributed intelligence programming stored in non-volatile memory, such that following any loss of power the lighting control zones must operate according to their defined default settings and sequence of operations.

7. Lighting control zones must be capable of being networked with a higher-level system backbone to provide time based control, remote control from inputs and/or systems external to the control zone, and remote configuration and monitoring through a software interface.

8. The system may include one or more system controllers that provide time-based control. The system controller also provides a means of connecting the lighting control system to a system software interface and building management systems via BACnet/IP or BACnet MS/TP protocol.

9. All system devices must support firmware update, either remotely or from within the applications space, for purposes of upgrading functionality at a later date.

B. Wired Networked Control Zone Characteristics

1. Connections to devices within a wired networked lighting control zone and to backbone components must be with a single type of low voltage network cable, which must be compliant with CAT5e specifications or higher. To prevent wiring errors, the use of mixed types of low voltage network cables is not permitted.

2. Devices in an area must be connected via a "daisy-chain" topology; requiring all individual networked devices to be connected back to a central component in a "hub-and-spoke" topology is not permitted, so as to reduce the total amount of network cable required for each control zone.

3. System must provide the option of having pre-terminated plenum rated low voltage network cabling supplied with hardware so as to reduce the opportunity for improper wiring and communication errors during system installation.

4. Following proper installation and provision of power, all networked devices connected together with low voltage network cable must automatically form a functional lighting

control zone without requiring any type of programming, regardless of the programming mechanism (e.g. software application, handheld remote, pushbutton). The "out of box" default sequence of operation is intended to provide typical sequence of operation so as to minimize the system startup and programming requirements and to also have functional lighting control operation prior to system startup and programming.

5. Once software is installed, system must be able to automatically discover all connected devices without requiring any provisioning of system or zone addresses.

6. All networked devices must have the ability to detect improper communication wiring and blink its LED in a specific cadence as to alert installation/startup personnel.

7. Networked control devices intended for control of egress and/or emergency light sources must not require the use of additional, externally mounted UL924 shunting and/or 0-10V disconnect devices, so as to provide a compliant sequence of operation while reducing the overall installation and wiring costs of the system. The following types of wired networked control devices must be provided for egress and/or emergency light fixtures:
   a. Low-Voltage power sensing: These devices must automatically provide 100% light level upon detection of loss of power sensed via the low voltage network cable connection.
   b. UL924 Listed Line-Voltage power sensing: These devices must be listed as emergency relays under the UL924 standard, and must automatically close the load control relay and provide 100% light output upon detection of loss of power sensed via line voltage connection to normal power.

8. Networked luminaires and intelligent lighting control devices located in different areas must be able to transmit and track information within at least 128 system-wide control zones to support required sequences of operation that may span across multiple areas. Occupancy and photocell commands must be available across a single controller, and switch commands must be available across single or multiple controllers. These must also be referred to as global control zones.

9. Wired networked Wall stations must provide the follow Scene Control Capabilities:
   a. Preset Scenes that can activate a specific combination of light levels across multiple local and global channels, as required.
   b. Profile Scenes that can modify the sequence of operation for the devices in the area (group) in response to a button press. This capability is defined as supporting "Local Profiles" and is used to dynamically optimize the occupant experience and lighting energy usage. Wall stations must be able to manually start and stop Local Profiles, or the local profile must be capable of ending after a specific duration of time between 5 minutes and 12 hours. Parameters that must be configurable and assigned to a Local Profile must include fixture light level, occupancy time delay, response to occupancy sensors (including enabling/disabling response), response to daylight sensors (including enabling/disabling response), and enabling/disabling of wall stations.
   c. 3-way / multi-way control: multiple wall stations must be capable of controlling the same local and global control zones, so as to support "multi-way" preset scene and profile scene control.

C. System Integration Capabilities

1. The system must interface with third party building management systems (BMS) to support two-way communication using the industry standard BACnet/IP or BACnet MS/TP

protocols. The following system integration capabilities must be available via BACnet/IP and BACnet MS/TP protocols:

a. The system must support control of individual devices, including control of relay and dimming output.
b. The system must support reading of individual device status information. The available status will depend on the individual device type and capabilities, which may include relay state, dimming output, power measurement, occupancy sensor status, and photocell sensor states or readings. All system devices must be available for polling for devices status.
c. The system must support activation of pre-defined system as outlined in the para 2.3 D "Supported Sequence of Operations".

D. Supported Sequence of Operations

1. Control Zones
   a. Networked luminaires and intelligent lighting control devices installed in an area (also referred to as a group of devices) must be capable of transmitting and tracking occupancy sensor, photocell sensor, and manual switch information within at least 48 unique control zones to support different and reconfigurable sequences of operation within the area. These must also be referred to as local control zones.

2. Wall station Capabilities
   a. Wall stations must be provided to support the following capabilities:
      1) On/Off of a local control zone.
      2) Continuous dimming control of light level of a local control zone.
   b. 3-way / multi-way control: multiple wall stations must be capable of controlling the same local control zones, so as to support "multi-way" switching and/or dimming control.

3. Occupancy Sensing Capabilities
   a. Occupancy sensors must be configurable to control a local zone.
   b. Multiple occupancy sensors must be capable of controlling the same local zones. This capability combines occupancy sensing coverage from multiple sensors without consuming multiple control zones.
   c. System must support the following types of occupancy sensing sequence of operations:
      1) On/Off Occupancy Sensing
      2) Partial-On Occupancy Sensing
      3) Partial-Off Occupancy Sensing
      4) Vacancy Sensing (Manual-On / Automatic-Off)
   d. On/Off, Partial-On, and Partial-Off Occupancy Sensing modes must function according to the following sequence of operation:
      1) Occupancy sensors must automatically turn lights on to a designated level when occupancy is detected. To support fine tuning of Partial-On sequences the designated occupied light level must support at least 100 dimming levels.
      2) Occupancy sensors must automatically turn lights off or to a dimmed state (Partial-Off) when vacancy occurs or if sufficient daylight is detected. To support fine tuning of Partial-Off sequences the designated unoccupied dim level must support at least 100 dimming levels.
      3) To provide additional energy savings the system must also be capable of combining Partial-Off and Full-Off operation by dimming the lights to a

designated level when vacant and then turning the lights off completely after an additional amount of time.

4) Photocell readings, if enabled in the Occupancy Sensing control zone, must be capable of automatically adjusting the light level during occupied or unoccupied conditions as necessary to further reduce energy usage. Additional requirements and details for photocell sensing capabilities are indicated under "Photocell Sensing Capabilities."

5) The use of a wall station must change the dimming level or turn lights off as selected by the occupant. The lights must optionally remain in this manually-specified light level until the zone becomes vacant; upon vacancy the normal sequence of operation, as defined above, must proceed.

e. Vacancy Sensing mode (also referred to as Manual-On / Automatic-Off) must function according to the following sequence of operation:

1) The use of a wall station is required turn lights on. The system must be capable of programming the zone to turn on to either to a designated light level or the previous user light level. Initially occupying the space without using a wall station must not result in lights turning on.

2) Occupancy sensors must automatically turn lights off or to a dimmed state (Partial-Off) when vacancy occurs or if sufficient daylight is detected. To support fine tuning of Partial-Off sequences the designated unoccupied dim level must support at least 100 dimming levels.

3) To provide additional energy savings and an enhanced occupant experience, the system must also be capable of dimming the lights when vacant and then turning the lights off completely after an additional amount of time.

4) To minimize occupant impact in case the area or zone is still physically occupied following dimming or shutoff of the lights due to detection of vacancy, the system must support an "automatic grace period" immediately following detection of vacancy, during which time any detected occupancy must result in the lights reverting to the previous level. After the grace period has expired, the use of a wall station is required to turn lights on.

5) Photocell readings, if enabled in the Occupancy Sensing control zone, must be capable of automatically adjusting the light level during occupied or unoccupied conditions as necessary to further reduce energy usage. Additional requirements and details for photocell sensing capabilities are indicated under "Photocell Sensing Capabilities".

6) At any time, the use of a wall station must change the dimming level or turn lights off as selected by the occupant. The lights must optionally remain in this manually-specified light level until the zone becomes vacant; upon vacancy the normal sequence of operation, as defined above, must proceed.

f. To accommodate diverse types of environments, occupancy time delays before dimming or shutting off lights must be specifiable for control zones between 15 seconds to 2 hours.

4. Photocell Sensing Capabilities (Automatic Daylight Sensing)

a. Photocell sensing devices must be configurable to control a local zone.

b. The system must support the following type of photocell-based control:

1) Continuous Dimming: The control zone automatically adjusts its dimming output in response to photocell readings, such that a minimum light level consisting of both electric light and daylight sources is maintained at the task.

The photocell response must be configurable to adjust the photocell setpoint and dimming rates.

5. Schedule Capabilities
   a. System must support the creation of time schedules for time-of-day override of devices including offsets from dusk and dawn.
   b. System must support blink warning and timed extension capabilities. At the end of a scheduled period, the system must be capable of providing a visible "blink warning" 5 minutes prior to the end of the schedule. Wall stations may be programmed to provide timed overrides that turn the lights on for an additional period of time. Timed override duration must be programmable for each individual device, zone of devices, or customized group of devices, ranging from 5 minutes to 12 hours.

6. Global Profile Capabilities
   a. The system must be capable of automatically modifying the sequence of operation for selected devices in response to any of the following: a time-of-day schedule, contact closure input state, manually triggered wired wall station input, RS-232/RS-485 command to wired input device, and BACnet input command. This capability is defined as supporting "Global Profiles" and is used to dynamically optimize the occupant experience and lighting energy usage.
   b. Global profiles may be scheduled with the following capabilities:
      1) Global Profiles must be stored within and executed from the system controller (via internal timeclock) such that a dedicated software host or server is not required to be online to support automatic scheduling and/or operation of Global Profiles.
      2) Global Profile time-of-day schedules must be capable of being given the following recurrence settings: daily, specific days of week, every "n" number of days, weekly, monthly, and yearly. Lighting control profile schedules must support definition of start date, end date, end after "n" recurrences, or never ending. Daylight savings time adjustments must be capable of being performed automatically, if desired.
      3) Global Profile Holiday Schedules should follow recurrent settings for specific US holiday dates regardless if they always occur on a specific date or are determined by the day/week of the month.
      4) Global Profiles must be capable of being scheduled to run according to timed offsets relative to sunrise or sunset. Sunrise/sunset times must be automatically derived from location information using an astronomical clock.
      5) Software management interface must be capable of displaying a graphic calendar view of profile schedules for each control zone.
   c. System Global Profiles must have the following additional capabilities:
      1) Global Profiles must be capable of being manually activated directly from the system controller, specially programmed wired input devices, scene capable wired wall stations, and the software management interface.
      2) Global Profiles must be selectable to apply to a single device, zone of devices, or customized group of devices.
      3) Parameters that must be configurable and assigned to a Global Profile must include fixture light level, occupancy time delay, response to occupancy sensors (including enabling/disabling response), response to daylight sensors (including enabling/disabling response), and enabling/disabling of wall stations.

d. A backup of Local and Global Profiles must be stored on the software's host server such that the Profile backup can be applied to a replacement system controller or wired wall station.

7. System must support automated demand response capabilities with automatic reduction of light level to at least three levels of demand response.

2.4 SYSTEM SOFTWARE INTERFACES

A. Management Interface

1. System must provide a web-based management interface that provides remote system control, live status monitoring, and configuration capabilities of lighting control settings and schedules.
2. Management interface must be compatible with industry-standard web browser clients, including Microsoft Internet Explorer, Apple Safari, Google Chrome, Mozilla Firefox or approved equal.
3. Management interface must require all users to login with a User Name and Password, and must support creation of at least 100 unique user accounts.
4. Management interface must support at least three permission levels for users: read-only, read & change settings, and full administrative system access.
5. Management interface must be capable of restricting access for user accounts to specific devices within the system.
6. All system devices must be capable of being given user-defined names.
7. The following device identification information must be displayed in the Management interface: model number, model description, serial number or network ID, manufacturing date code, custom label(s), and parent network device.
8. Management interface must be able to read the live status of a networked luminaire or intelligent control device and must be capable of displaying luminaire on/off status, dim level, power measurement, device temperature, PIR occupancy sensor status, microphonic occupancy sensor status, remaining occupancy time delay, photocell reading, and active Profiles.
9. Management interface must be able to read the current active settings of a networked luminaire or intelligent control device and must be capable of displaying dimming trim levels, occupancy sensor and photocell enable/disable, occupancy sensor time delay and light level settings, occupancy sensor response (normal or vacancy), and photocell setpoints and transition time delays.
10. Management interface must be able to change the current active settings and default settings for an individual networked luminaire or intelligent control device.
11. Management interface must be capable of applying settings changes for a zone of devices or a group of selected devices using a single "save" action that does not require the user to save settings changes for each individual device.
12. A printable network inventory report must be available via the management interface.
13. A printable report detailing all system profiles must be available via the management interface.

14. All sensitive information stored by the software must be encrypted.

15. All system software updates must be available for automatic download and installation via the internet.

B. Visualization and Programming Interfaces

1. System must provide an optional web-based visualization interface that displays graphical floorplan.

2. Graphical floorplan must offer the following types of system visualization:
   a. Full Device Option - A master graphic of the entire building, by floor, showing each control device installed in the project with zones outlined. This must include the following:
      1) Controls embedded light fixtures
      2) Controls devices not embedded in light fixtures
      3) Daylight Sensors
      4) Occupancy Sensors
      5) Wall Switches and Dimmers
      6) Scene Controllers
      7) Networked Relays
      8) Wired Bridges
      9) System Controllers
      10) Wired Relay Panels
      11) Group outlines
   b. Group Only Option - A master graphic of the entire building, by floor, showing only control groups outlined.
   c. Allow for pan and zoom commands so smaller areas can be displayed on a larger scale simply by panning and zooming each floor's master graphic.
   d. A mouse click on any control device must display the following information (as applicable):
      1) The device catalog number.
      2) The device name and custom label.
      3) Device diagnostic information.
      4) Information about the device status or current configuration is available with an additional mouse click.

2.5 SYSTEM BACKBONE AND SYSTEM INTEGRATION EQUIPMENT

A. System Controller

1. System Controller must be multi-tasking, real-time digital control processor consisting of modular hardware with plug-in enclosed processors, communication controllers, and power supplies.

2. System Controller must have 32-bit microprocessor operating at a minimum of 1 GHz.

3. System Controller must have minimum of 512MB memory, with a minimum of 4GB non-volatile flash, to support its own operating system and databases.

4. System Controller must perform the following functions:
   a. Time-based control of downstream wired and wireless network devices.
   b. Linking into an Ethernet network.

c. Integration with Building Management Systems (BMS) and Heating, Ventilation and Air Conditioning (HVAC) equipment.
d. Connection to various software interfaces, including management interface, historical database and analytics interface, and visualization interface.

5. System Controller must have an integral web server to support configuration, diagnostics and hosting of software interfaces.

6. Device must have option for a graphical touch screen to support configuration and diagnostics.

7. Device must have three RJ-45 networked lighting control ports for connection to any of the following:
   a. The graphical touch screen
   b. Wired communication bridges
   c. Direct connection to networked wired luminaires and intelligent lighting control devices (up to 128 total devices per port)

8. Device must automatically detect all networked devices connected to it.

9. Device must have an internal time clock used for astronomical and standard schedules.

10. Device must have 2 switched RJ-45 10/100 BaseT Ethernet ports for local area network (LAN) connection.
    a. Ethernet connection must support daisy chain wiring to other lighting control system LAN devices.
    b. Ethernet connection must support IPv4 and must be capable of using a dedicated static or DHCP assigned IP address.

11. Device must have 2 x USB 2.0 Expansion ports for 802.11 Wi-Fi Adapter enabling wireless connectivity including:
    a. Hot Spot
    b. Access Point
    c. Client

12. Each System Controller must be capable of managing and operating at least 750 networked devices.
    a. Multiple System Controllers may be networked together via LAN connection to scale the system up to 20,000 networked devices.

13. System Controller must support BACnet/IP and BACnet MS/TP protocols to directly interface with BMS and HVAC equipment without the need for additional protocol translation gateways.
    a. BACnet MS/TP must support 9600 to 115200 baud rate.
    b. System Controller must be BACnet Testing Laboratory (BTL listed) using Device Profile BACnet Building Controller (B-BC) with outlined enhanced features.

14. System controller must contain a “FIPS 140-2 Level 1 Inside” cryptographic module.

15. System controller must support RESTful API control of BACnet objects, user management, date and time, and file management.

16. System controller must be available within a NEMA 1 enclosure with Class 1 and Class 2 separation
    a. Enclosure must support power input power of 120-277VAC, or optional 347.

B. Digital Electronic Time Clock (DTC)

1. DTC must control and program a linear bus of lighting devices and supply all time functions without connection to a system controller.
   a. Programming of the linear bus of lighting devices must not require additional hardware, including computers, specialized dongles, or other connection devices.

2. Programming of the linear bus must be exclusively done through the touch screen interface.
   a. DTC must be capable of up to 32 schedules. Each schedule must consist of one set of On and Off times per day for each day of the week and for each of two holiday lists. The schedules must apply to any individual relay or group of relays.
   b. DTC must be run from non-volatile memory so that all system programming is retained indefinitely.
   c. DTC must be optionally mounted inside of a relay panel. Installation inside of the relay panel must eliminate the necessity of any additional enclosures for complete installation.
   d. DTC must have a capacitive 3.5” full color touch screen.

2.6 WIRED NETWORKED DEVICES

A. Wired Networked Wall Switches, Dimmers, Scene Controllers

1. Devices must recess into single-gang switch box and fit a standard GFI opening.

2. Communication and low voltage power must be delivered to each device via standard low voltage network cabling with RJ-45 connectors.

3. All switches must have the ability to detect when it is not receiving valid communication and blink its LED in a pattern to visually indicate a potential wiring issue.

4. Devices with mechanical push-buttons must provide tactile and LED user feedback.

5. Devices with mechanical push-buttons must be made available with custom button labeling.

6. Wall switches & dimmers must support the following device options:
   a. Number of control zones: 1, 2 or 4
   b. Control Types Supported:
      1) On/Off
      2) On/Off/Dimming
      3) On/Off/Dimming/Correlated Color Temperature Control for specific luminaire types
   c. Colors: Ivory, White, Light Almond, Gray, Black, Red

7. Scene controllers must support the following device options:
   a. Number of scenes: 1, 2 or 4
   b. Control Types Supported:
      1) On/Off
      2) On/Off/Dimming
      3) Preset Level Scene Type
      4) On/Off/Dimming/Preset Level for Correlated Color Temperature
      5) Reprogramming of other devices within daisy-chained zone so as to implement user selected lighting scene. This must support manual start/stop

from the scene controller, or optionally programmed to automatically end after a user selectable duration between 5 minutes and 12 hours.

6) Selecting a lighting profile to be run by the system's upstream controller so as to implement a selected lighting profile across multiple zones. This must support manual start/stop from the scene controller, or optionally programmed to automatically end after a user selectable duration between 5 minutes and 12 hours.

c. Colors: Ivory, White, Light Almond, Gray, Black, Red

B. Wired Networked Graphic Wall Stations

1. Device must surface mount to single-gang switch box.

2. Device must have a 3.5", capacitive full color touch screen.

3. Device must be powered with Class 2 low voltage supplied locally via a directly wired power supply.

4. Device must have a micro-USB style connector for local computer connectivity.

5. Device must enable mobile application control of control zones and scenes. Communication must be over standard low voltage network cabling with RJ-45 connectors.

6. Device must enable user supplied screen saver image to be uploaded within one of the following formats: jpg, png, gif, bmp, tif.

7. Device must enable configuration of all switches, dimmers, control zones, and lighting preset scenes via password protected setup screens.

8. Graphic wall stations must support the following device options:
   a. Number of control zones: Up to 16
   b. Number of scenes: Up to 16
   c. Profile type scene duration: User configurable from 5 minutes to 12 hours
   d. Colors: White, Black

C. Wired Networked Digital Key Switches

1. Devices must recess into single-gang switch box and fit a standard GFI opening.

2. Communication and low voltage power must be delivered to each device via standard low voltage network cabling with RJ-45 connectors.

3. All switches must have the ability to detect when it is not receiving valid communication and blink its LED in a pattern to visually indicate a potential wiring issue.

4. Devices must have LED user feedback to provide indication of on/off status of the programmed lights or scene, as well as indication of device power.

5. Digital key switches must support the following device options:
   a. Control Types Supported:
      1) On/Off
      2) On/Off/Dimming
      3) Preset Level Scene Type
      4) Reprogramming of other devices within daisy-chained zone so as to implement user selected lighting scene. This must support manual start/stop from the scene controller, or optionally programmed to automatically end after a user selectable duration between 5 minutes and 12 hours.

5) Selecting a lighting profile to be run by the system's upstream controller so as to implement a selected lighting profile across multiple zones. This must support manual start/stop from the scene controller, or optionally programmed to automatically end after a user selectable duration between 5 minutes and 12 hours.

b. Colors: Ivory, White, Light Almond, Stainless Steel

D. Wired Networked Auxiliary Input / Output (I/O) Devices

1. Devices must be plenum rated and be inline wired, screw mountable, or have an extended chase nipple for mounting to a ½" knockout.

2. Communication and low voltage power must be delivered to each device via standard low voltage network cabling with RJ-45 connectors.

3. Auxiliary Input/Output Devices must be specified as an input or output device with the following options:

a. Contact closure or Pull High input

1) Input must be programmable to support maintained or momentary inputs that can activate local or global scenes and profiles, activate lights at a preconfigured level, ramp light level up or down, or toggle lights on/off.

b. 0-10V analog input

1) Input must be programmable to function as a daylight sensor.

c. RS-232/RS-485 digital input

1) Input supports activation of up to 4 local or global scenes and profiles, and on/off/dimming control of up to 16 local control zones.

d. 0-10V dimming control output, capable of sinking up to 20mA of current

1) Output must be programmable to support all standard sequence of operations supported by system.

e. Digital control output via EldoLED code communication

1) Output must be programmable to support light intensity control, as well as optional correlated color temperature (CCT) control, of the connected luminaire.

E. Wired Networked Occupancy and Photosensors

1. Occupancy sensors must sense the presence of human activity within the desired space and fully control the on/off function of the lights.

2. Sensors must utilize passive infrared (PIR) technology, which detects occupant motion, to initially turn lights on from an off state, thus preventing false on conditions. Ultrasonic or Microwave based sensing technologies must not be accepted.

3. For applications where a second method of sensing is necessary to adequately detect maintained occupancy (such as in rooms with obstructions), a sensor with an additional "dual" technology must be used.

4. Dual technology sensors must have one of its two technologies not require motion to detect occupancy. Acceptable dual technology includes PIR/Microphonics (also known as Passive Dual Technology or PDT) which both looks for occupant motion and listens for sounds indicating occupants. Sensors where both technologies detect motion (PIR/Ultrasonic) are not acceptable.

5. All sensing technologies must be acoustically passive, meaning they do not transmit sounds waves of any frequency (for example in the Ultrasonic range), as these technologies have the potential for interference with other electronic devices within the space (such as electronic white board readers). Acceptable detection technologies include Passive Infrared (PIR), and/or Microphonics technology. Ultrasonic or Microwave based sensing technologies must not be accepted.
6. System must have ceiling, fixture, recessed & corner mounted sensors available, with multiple lens options available customized for specific applications.
7. Communication and low voltage power must be delivered to each device via standard low voltage network cabling with RJ-45 connectors.
8. All sensors must have the ability to detect when it is not receiving valid communication and blink its LED in a pattern to visually indicate a potential wiring issue.
9. Sensor programming parameter must be available and configurable remotely from the software and locally via the device push-button.
10. Ceiling mount occupancy sensors must be available with zero or one integrated dry contact switching relays, capable of switching 1 amp at 24 VAC/VDC (resistive only).
11. Sensors must be available with one or two occupancy “poles”, each of which provides a programmable time delay.
12. Sensors must have optional features for photosensor/daylight override, automatic dimming control, and low temperature/high humidity operation.
13. Photosensor must provide for an on/off set-point, and a dead band to prevent the artificial light from cycling. Delay must be incorporated into the photocell to prevent rapid response to passing clouds.
14. Photosensor and dimming sensor’s set-point and dead band must be automatically calibrated through the sensor’s microprocessor by initiating an “Automatic Set-point Programming” procedure. Min and max dim settings as well as set-point may be manually entered.
15. Dead band setting must be verified and modified by the sensor automatically every time the lights cycle to accommodate physical changes in the space (i.e., furniture layouts, lamp depreciation, or lamp outages).
16. A dual zone option must be available for On/Off Photocell, Automatic Dimming Control Photocell, or Combination units. The secondary daylight zone must be capable of being controlled as an “offset” from the primary zone.

F. Wired Networked Wall Switch Sensors

1. Devices must recess into single-gang switch box and fit a standard GFI opening.
2. Communication and low voltage power must be delivered to each device via standard low voltage network cabling with RJ-45 connectors.
3. All wall switch sensors must have the ability to detect when it is not receiving valid communication and blink its LED in a pattern to visually indicate a potential wiring issue.
4. Devices with mechanical push-buttons must provide tactile user feedback.
5. Wall switches sensors must support the following device options:

a. User Input Control Types Supported: On/Off or On/Off/Dimming
b. Occupancy Sensing Technology: PIR only or Dual Tech acoustic
c. Daylight Sensing Option: Inhibit Photosensor
d. Colors: Ivory, White, Light Almond, Gray, Black, Red

G. Wired Networked Embedded Sensors

1. Network system must have embedded sensors consisting of occupancy sensors and/or dimming photocells that can be embedded into luminaire such that only the lens shows on luminaire face.

2. Occupancy sensor detection pattern must be suitable for 7.5’ to 20’ mounting heights.

3. Embedded sensors must support the following device options:
   a. Occupancy Sensing technology: PIR only or Dual Tech acoustic.
   b. Daylight Sensing Option: Occupancy only, Daylight only, or combination Occupancy/Daylight sensor.

H. Wired Networked Power Packs and Secondary Packs

1. Power Packs must incorporate one optional Class 1 relay, optional 0-10 VDC dimming output, and contribute low voltage Class 2 power to the rest of the system.

2. Power Packs must accept 120 or 277 VAC (or optionally 347 VAC) and carry a plenum rating.

3. Secondary Packs must incorporate the relay and 0-10 VDC or line voltage dimming output, but must not be required to contribute system power.

4. Power Supplies must provide system power only, but are not required to switch line voltage circuit.

5. Auxiliary Relay Packs must switch low voltage circuits only, capable of switching 1 amp at 40 VAC/VDC (resistive only).

6. Communication must be delivered to each device via standard low voltage network cabling with RJ-45 connectors. Secondary packs must receive low voltage power via standard low voltage network cable.

7. Power Pack programming parameters must be available and configurable remotely from the software and locally via the device push-button.

8. Power Pack must securely mount through a threaded ½ inch chase nipple or be capable of being secured within a luminaire ballast/driver channel. Plastic clips into junction box must not be accepted. All Class 1 wiring must pass through chase nipple into adjacent junction box without any exposure of wire leads. Note: UL Listing under Energy Management or Industrial Control Equipment automatically meets this requirement, whereas Appliance Control Listing does not meet this safety requirement.

9. Power Pack must install inside standard electrical enclosure and provide UL recognized support to junction box. All Class 1 wiring is to pass through chase nipple into adjacent junction box without any exposure of wire leads.

10. Power/Secondary Packs must be available with the following options:
    a. Power Pack capable of full 16-Amp switching of all normal power lighting load types, with optional 0-10V dimming output capable of up to 100mA of sink current.

b. Secondary Pack with UL924 listing for switching of full 16-Amp Emergency Power circuits, with optional 0-10V dimming output capable of up to 100mA of sink current.
c. Power and Secondary Packs capable of full 20-Amp switching of general purpose receptacle (plug-load) control.
d. Secondary Pack capable of full 16-Amp switching of all normal power lighting load types.
e. Secondary Pack capable of 5-Amps switching and dimming 120 VAC incandescent lighting loads or 120/277 VAC line voltage dimmable fluorescent ballasts (2-wire and 3-wire versions).
f. Secondary Pack capable of 5-Amps switching and dimming of 120/277 VAC magnetic low voltage transformers.
g. Secondary Pack capable of 4-Amps switching and dimming of 120 VAC electronic low voltage transformers.
h. Secondary Pack capable of providing a pulse on/pulse off signal for purposes of controlling shade systems via relay inputs.
i. Secondary Pack capable of switching 1 amp at 40 VAC/VDC (resistive only) with the intent to provide relay signal to auxiliary system (e.g. BMS).
j. Power Supply capable of providing auxiliary bus power (no switched or dimmed load).

I. Wired Networked Luminaires

1. Product Series: Networked Luminaires must be factory enabled with embedded networking capability:
   a. Networked luminaire must have a mechanically integrated control device.
2. Networked LED luminaire must have two RJ-45 ports available (via control device directly or incorporated RJ-45 splitter).
3. Networked LED luminaire must be able to digitally network directly to other network control devices (sensors, photocells, switches, dimmers).
4. Networked LED luminaire must provide low voltage power to other networked control devices (excluding EMG and CCT capable versions).
5. System must be able to turn on/off specific LED luminaires without using a relay, if LED driver supports “sleep mode.”
6. System must be able to maintain constant lumen output over the specified life of the LED luminaire (also called lumen compensation) by automatically varying the dimming control signal to account for lumen depreciation.
   a. System must indicate (via a blink warning) when the LED luminaire is no longer able to compensate for lumen depreciation.
7. System must be able to provide control of network luminaire intensity, in addition to correlated color temperature of specific LED luminaires.
8. System must be able to provide control of network luminaire intensity, in addition to dynamic features, such as grayscale and color accent of specific LED luminaires.

J. Wired Networked Relay and Dimming Panel

1. Relay and dimming panel must be available with 4, 8, 12, 16, 24, 32, 40 or 48 individual relays per panel, with an equal number of individual 0-10V dimming outputs.
2. Optional Field Configurable Relays (FCR) used must have the following required properties:
   a. Configurable in the field to operate with single-, double-, or triple-pole relay groupings.
   b. Configurable in the field to operate with normally closed or normally open behavior.
   c. Provides visual status of current state and manual override control of each relay.
   d. Listed for the following minimum ratings:
      1) 40A @ 120-480VAC Ballast
      2) 16A @ 120-277VAC Electronic
      3) 20A @ 120-277VAC Tungsten
      4) 20A @ 48VDC Resistive
      5) 2HP @ 120VAC
      6) 3HP @ 240-277VAC
      7) 65kA SCCR @ 480VAC
3. 0-10 dimming outputs must support a minimum of 100mA sink current per output.
4. Relay and dimming outputs must be individually programmable to support all standard sequence of operations as defined in this specification.
5. Panel must be UL924 listed for control of emergency lighting circuits.
6. Panel must power itself from an integrated 120-277 VAC or optional 347VAC supply.
7. Panel must provide a configurable low-voltage sensor input with the following properties:
   a. Configurable to support any of the following input types:
      1) Indoor Photocell
      2) Outdoor Photocell
      3) Occupancy Sensor
      4) Contact Closure
   b. Low voltage sensor input must provide +24VDC power for the sensor so that additional auxiliary power supplies are not required.
   c. Sensor input supports all standard sequence of operations as defined in this specification.
8. Panel must provide a contact closure input for each group of 8-relays that acts as a panel override to activate the normally configured state of all relays (i.e., normally open or normally closed) in the panel. This input is intended to provide an interface to alarm systems, fire panels, or BMS system to override the panel.
9. Panel must supply current limited low voltage power to other networked devices connected via low voltage network cable.
10. Panel must be available with NEMA 1 rated enclosure with the following mounting and cover options:
    a. Surface-mounted for all panel sizes
    b. Flush-mounted for up to 16 relay panel sizes
    c. Screw-fastened for up to 16 relay panel sizes
    d. Hinged cover with keyed lock for all panel sizes
11. Surface-mounted screw cover options for 8 and 16 relay panel sizes must be plenum rated.

12. Panel must be rated from 0-50C for 8 and 16 enclosure sizes, and 0-45C for 32 and 48 enclosure sizes.

K. Wired Networked Bluetooth Low Energy Programming Device

1. Device must be plenum rated and be inline wired, screw mountable.
2. Communication and low voltage power must be delivered to device via standard low voltage network cabling with RJ-45 connectors.
3. Bluetooth Low Energy connection must allow connection from smartphone application for programming device settings within the local daisy-chain zone.
   a. Device must provide visual indication of remote Bluetooth connection via LED integrated into device enclosure such that it is visible from all angles while the zone is being programmed.

L. Wired Networked Communication Bridge

1. Device must surface mount to a standard 4” x 4” square junction box.
2. Device must have 8 RJ-45 ports for connection to lighting control zones (up to 128 devices per port), additional network bridges, and System Controller.
3. Device must be capable of aggregating communication from multiple lighting control zones for purposes of minimizing backbone wiring requirements back to System Controller.
4. Device must be powered with Class 2 low voltage supplied locally via a directly wired power supply, or powered via low voltage network connections from powered lighting control devices (e.g. power packs).
5. Wired Bridge must be capable of redistributing power from its local supply and connected lighting control zones with excess power to lighting control zones with insufficient local power. This architecture also enables loss of power to a particular area to be less impactful on network lighting control system.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION REQUIREMENTS

A. Installation Procedures and Verification

1. Review all required installation and pre-startup procedures with the manufacturer’s representative through pre-construction meetings.
2. Install and connect the networked lighting control system components according to the manufacturer’s installation instructions, wiring diagrams, the project submittals and plans specifications.
3. Contractor is responsible for testing of all low voltage network cable. Contractor is responsible for verification of the following minimum parameters:

a. Wire Map (continuity, pin termination, shorts and open connections, etc.)
b. Length
c. Insertion Loss

B. Coordination with the City of New York's IT Network Infrastructure.

1. Coordinate with the Commissioner to secure all required network connections to the City of New York's IT network infrastructure.
   a. Provide to the Commissioner all network infrastructure requirements of the networked lighting control system.
   b. Provide to the manufacturer's representative all necessary contacts pertaining to the City of New York's IT infrastructure, to ensure that the system is properly connected and started up.

C. Documentation and Deliverables

1. Contractor must be responsible for documenting installed location of all networked devices, including networked luminaires. This includes responsibility to provide as-built plan drawing showing device address barcodes corresponding to locations of installed equipment.

2. Contractor is also responsible for the following additional documentation to the manufacturer's representative.
   a. As-Built floor plan drawings showing device address locations required above. All documentation must remain legible when reproducing\scanning drawing files for electronic submission.
   b. As-Built electrical lighting drawings (reflected ceiling plan) in PDF and CAD format. Architectural floor plans must be based on as-built conditions.
      1) CAD files must have layers already turned on/off as desired to be shown in the graphical floorplan background images. The following CAD elements are recommended to be hidden to produce an ideal background graphical image:
         a) Titleblock.
         b) Text- Inclusive of room names and numbers, fixture tags and drawings notes.
         c) Fixture wiring and homeruns.
         d) Control devices.
         e) Hatching or poché of light fixtures or architectural element.s
      2) CAD files must be of AutoCAD version as dirceted by Commissioner.

3.3 SYSTEM STARTUP

A. Upon completion of installation by the installer, including completion of all required verification and documentation required by the manufacturer, the system must be started up and programmed.

1. For CAT5 wired devices, low voltage network cable testing must be performed prior to system startup.

B. System start-up and programming must include:

1. Verifying operational communication to all system devices.

2. Programming the network devices into functional control zones to meet the required sequence of operation.
3. Programming and verifying all sequence of operations.

C. Initial start-up and programming is to occur on-site.

3.4 PROJECT TURNOVER

A. System Documentation
1. Submit software database file with desired device labels and notes completed.
2. Grant access to the Commissioner for the programming database, if requested.

B. City of New York's Staff Instruction.
1. Provisions for onsite instruction must be included in submittal package.

END OF SECTION 26 09 23

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 26 24 16 - PANELBOARDS

PART 1- GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. This Section includes the following:

1. Lighting and appliance branch circuit panelboards.
2. Power and distribution panelboards.

B. Related Sections:

1. Section 26 28 13 “Fuses” for fuses.
2. Section 26 2816.13 “Enclosed Circuit Breakers” for breakers.
3. Section 26 28 16.16 “Enclosed Switches” for switches.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures’

1.4 SUBMITTALS

A. Product Data: For each type of panelboard, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each panelboard and related equipment.

1. Dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings. Include the following:

a. Enclosure types and details for types other than NEMA 250, Type 1.
b. Bus configuration, current, and voltage ratings.
c. Short-circuit current rating of panelboards and overcurrent protective devices.
d. UL listing for series rating of installed devices.
e. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

C. Field Test Reports: Submit written test reports and include the following:

1. Test procedures used.
2. Test results that comply with requirements.
3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

D. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing. Panelboard schedules must indicate room names/locations where the electrical devices being served are located.

E. Operation and Maintenance Data: For panelboards and components include the following:

1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
2. Time-current curves, including selectable ranges for each type of overcurrent protective device.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Assurance”.

B. Source Limitations: Obtain panelboards, OCD’s, components and accessories through one source from a single manufacturer.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by Underwriters Laboratories Inc.

D. Comply with NEMA PB 1.

E. Comply with New York City Electrical Code - 2014.

1.6 DEFINITIONS

A. Panelette (Load Center): A panelboard with thermal magnetic molded case circuit-breaker branches, primarily of the plug-in type, designed for residential and light commercial projects, operating at 240 Volts and below, available in both single and 3-phase versions, and equipped with flush mounting trim.

B. Overcurrent Protective Device (OCD) (OCPD): A device operative on excessive current that causes and maintains the interruption of power in the circuit it protects.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Rate equipment for continuous operation under the following conditions, unless otherwise indicated:

1. Ambient Temperature: Not exceeding 104 degrees F (40 degrees C).

2. Altitude: Not exceeding 6600 feet (2000 m).

B. Service Condition: NEMA PB 1, usual service conditions, as follows:

1. Ambient temperature within limits specified.

2. Altitude not exceeding 6600 feet (2000 m).

1.8 COORDINATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, and encumbrances to workspace clearance requirements.

1.9 WARRANTY

A. The manufacturer must provide a minimum one-year warranty on all panels supplied against manufacturing defects from the date of substantial completion.

1.10 GUARANTEE

A. Provide a minimum one-year guarantee for installation of all panels from the date of substantial completion.

PART 2 - PRODUCTS

2.1 PANELBOARD MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Siemens Energy & Automation, Inc.

2. General Electric Co.; Electrical Distribution & Control Div.

3. Eaton Corp.; Cutler-Hammer Products.

4. Square D Co.

5. Or approved equal.

2.2 MANUFACTURED UNITS

A. Factory tests: Dielectric test, phase to phase and phase to ground, at twice the rated voltage plus 1,000 volts (1,500 volts minimum) for one minute. Date of test and the name and title of the individual certifying the test must be indicated on a label affixed to the equipment.

B. Enclosures: Flush- and surface mounted cabinets. NEMA PB 1, Type 1, to meet environmental conditions at installed location.

1. Outdoor Locations: NEMA 250, Type 3R.

2. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.

C. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.

D. Finish: Manufacturer's standard enamel finish over corrosion-resistant treatment or primer coat.

E. Directory Card: With transparent protective cover, mounted inside metal frame, inside panelboard door.

F. Bus: Hard-drawn copper, 98 percent conductivity.

G. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors; bonded to box.

H. Main and Neutral Lugs: Type suitable for use with conductor material.

I. Feed-through Lugs: Type suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.

J. Service Equipment Label: UL labeled for use as service equipment for panelboards with main service disconnect switches.

K. Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices.

L. Where wires or cables are used within panelboards to make up internal connections (factory installed or otherwise) such wire or cable must have copper conductors only.

M. Where indicated or as required to assure ready accessibility of top switching and overcurrent device, they must be arranged as multiple adjacent sections. A single overall cabinet must be supplied for the multiple adjacent sections which constitute one panel. 1/4 inch (7 mm) minimum thickness plastic barriers having adequate angle iron framing support all around must be included between sections. The entire assembly must be such as to include wiring gutter space for each section as if it were an individual panelboard. Common bussing must be arranged for adjacent sections unless there is indication that the individual sections are to be separately supplied. Sub-feed lugs with full capacity cable taps to adjacent panel sections will be accepted as the bussing method.

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

B. Doors: Concealed hinges, secured with flush latch with tumbler lock.

C. Product Description: NEMA PB1, circuit breaker type, lighting and appliance branch circuit panelboard.

D. Panelboard Bus: Copper, current carrying components, ratings as indicated on Drawings. Furnish copper ground bus in each panelboard; furnish insulated ground bus as indicated on Drawings.

E. Minimum Integrated Short Circuit Rating: 22,000 amperes rms symmetrical for 208 volt panelboards. The final short circuit rating must be as required due to available short circuit.

F. Molded Case Circuit Breakers: NEMA AB 1, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles, listed as Type SWD for lighting circuits, Type HACR for air conditioning equipment circuits, Class A ground fault interrupter circuit breakers as indicated on Drawings. Do not use tandem circuit breakers.

G. Enclosure: NEMA PB 1, Type 1

H. Cabinet Front: Flush or Surface (as indicated on drawings) cabinet front with concealed trim clamps, concealed hinge, metal directory frame, and flush lock keyed alike. Finish in manufacturer's standard gray enamel.

2.4 OVERCURRENT PROTECTIVE DEVICES

A. As described in Section 26 28 13 “Fuses”, Section 26 2816.13 “Enclosed Circuit Breakers” and Section 26 28 16.16 “Enclosed Switches”.

2.5 ACCESSORY COMPONENTS AND FEATURES

A. Accessory Set: Include tools and miscellaneous items as required for overcurrent protective device test, inspection, maintenance, and operation.

B. Switch and fuse units incorporated as part of panelboards must be equipped with factory installed rejection clips to restrict fuses to types specified in Section 26 28 13 “Fuses”. Modify or replace in field any incorrect fuse clips.

C. Provide "lock-on" clips for the toggle handles of 5 percent of the branches in all lighting and appliance panels. Apply these clips to circuits supplying emergency battery units, night lights and others as directed in the field.

D. Furnish handle padlock attachments for 5 percent of the branches in lighting and appliance panels, and padlocks (with key) for 10 percent of these padlock attachments, but not less than 10 locks. Apply the padlock attachments to circuits (as directed in the field) for which the branch circuit device must be lockable in the "off" position in order to provide code-approved disconnect means.

2.6 PANELBOARD SHORT CIRCUIT RATINGS

A. Panelboards and Panelettes (load centers) must bear U.L. labels attesting to the adequacy of the equipment to withstand, and interrupt short-circuit currents not less than those available at their incoming terminals. Panels must either be fully rated or must be series rated in conjunction with integral or remote upstream overcurrent devices. U.L. labels must include size and type of allowable upstream and branch circuit devices and series connected ratings.

1. Main Distribution Panel must be "fully rated" for 100,000 amps when used in conjunction with appropriate current limiting fuses as specified.

2. Distribution panels must be "fully rated" for not less than 65,000 amps.

3. 120/208 volt power or distribution panels must be fully rated for not less than 22,000 amps.

4. 120/208 volt lighting or appliance panels must be "fully rated" for 22,000 amps.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Install panelboards and accessories according to NEMA PB 1.1.

B. Mount top of trim 74 inches (188 cm) above finished floor, unless otherwise indicated.

C. Mount plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.

D. Install overcurrent protective devices and controllers.

1. Set field-adjustable switches and circuit-breaker trip ranges.

E. Install filler plates in unused spaces.

F. Stub four 1-inch (DN 25) empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch (DN 25) empty conduits into raised floor space or below slab not on grade.

G. Arrange conductors in gutters into groups and bundle and wrap with wire ties.

3.3 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Section 26 05 53 “Identification for Electrical Systems."

B. Create a directory to indicate installed circuit loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.

C. Panelboard Nameplates: Label each panelboard with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

3.4 CONNECTIONS

A. Ground equipment according to Section 25 05 26 "Grounding and Bonding for Electrical Systems."

B. Connect wiring according to Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables".

3.5 FIELD QUALITY CONTROL

A. Prepare for acceptance tests as follows:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.

2. Test continuity of each circuit.

B. Perform the following field tests and inspections and prepare test reports:

1. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

C. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes.

1. Measure as directed during period of normal system loading.

2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility and at time directed. Avoid disrupting critical 24-hour services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.

3. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.

4. Tolerance: Difference exceeding 20 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.

D. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scanning of each panelboard. Remove panel fronts so joints and connections are accessible to portable scanner.

1. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

2. Record of Infrared Scanning: Prepare a certified report that identifies panelboards checked and describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.6 CLEANING

A. In completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Restore exposed surfaces to match original finish.

END OF SECTION 26 24 16

SECTION 26 27 13 - ELECTRCITY METERING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes provisions for the accommodation of Con Edison metering equipment.

B. Related Sections

1. Section 26 05 19 "Low-Voltage Electrical Power Conductor and Cables" for power conductors and cables.
2. Section 26 05 33 "Raceways and Boxes for Electrical Systems" for raceways.

1.3 SUBMITTAL PROCEDURES

A. Refer top DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Submit the following:

1. Product data for each product and component specified.
2. Shop drawings with indication of approved meter type by Con Edison for approval by Commissioner.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Assurance”.

B. Listing and Labeling: Provide components that are Underwriters Laboratories listed and labeled.

1. The terms "listed" and "labeled": As defined in the New York City Electrical Code -2014, Article 100.

C. Electrical Component Standard: Components and installation must comply with New York City Electrical Code- 2014, NFPA 70-2008.

1.6 GENERAL

A. All electricity delivered to the project will be Con Edison metered through various metering installations as follows:

1. Provide meter pan and/or backboards and current transformers cabinet and switchboard compartments as applicable for "house" metering within the building electric room.
2. Provide "house" meter totalizing impulse wiring systems.
3. Install current transformers furnished by the Con Edison.
4. Meters will be furnished and installed by the Con Edison.

B. All work for the metering installation must be provided in accordance with the latest edition of Con Edison Blue Book.

1.7 GUARANTEE

A. Provide a minimum one-year guarantee for installation of meter from the date of substantial completion.

PART 2 – PRODUCTS

2.1 EQUIPMENT FOR ELECTRICITY METERING

A. Meters will be furnished by Con Edison.

B. Current-Transformer Cabinets: Comply with requirements of Con Edison.

C. Meter Sockets: Comply with Con Edison requirements for electrical power.

D. Compliance with requirements:

1. Housing: NEMA 250, Type 1 enclosure.
2. Minimum Short-Circuit Rating: 100,000 A symmetrical at rated voltage unless Contractor submits calculation based on incoming short circuit rating provided Con Edison to show that a lower rating is acceptable.
3. Main Disconnect Device: Circuit breaker, series-combination rated for use with downstream feeder and branch circuit breakers.
4. Main Disconnect Device: Fusible switch, series-combination rated by circuit-breaker manufacturer to protect downstream feeder and branch circuit breakers.
5. Branch Feeder Circuit Breakers: Series-combination-rated molded-case units, rated to protect circuit breakers in downstream tenant and to house load centers and panelboards that have 10,000-A interrupting capacity.
6. Identification: Complying with requirements in Section 260553 "Identification for Electrical Systems".
7. Physical Protection: Tamper resistant, with hasp for padlock.

PART 3 – EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Comply with equipment installation requirements in NECA 1.

B. Install meters furnished by Con Edison.

C. Install raceways and equipment according to Con Edison written requirements.

D. Provide empty conduits for metering leads and extend grounding connections as required by the Commissioner.

END OF SECTION 26 27 13

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 26 27 26 - WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes

1. Wall switches.
2. Wall dimmers.
3. Receptacles.
4. Device plates and decorative box covers.
5. Floor box service fittings.
6. Access floor boxes.

B. Related Sections

1. Section 26 05 53 “Identification for Electrical Systems” for identifications.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

B. Samples: Submit one sample of each type device and cover plate.

C. Manufacturer's Instructions:
1. Indicate application conditions and limitations of use stipulated by product testing agency.
2. Include instructions for storage, handling, protection, examination, preparation, operation and installation of product.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.7 REFERENCES

A. NEMA WD 1 - General Purpose Wiring Devices.

B. NEMA WD 2 - Semiconductor Dimmers for Incandescent Lamps.

C. NEMA WD 6 - Wiring Device Configurations.

1.8 GUARANTEE

A. Provide a minimum one-year guarantee for installation of all wiring devices from the date of substantial completion.

PART 2 - PRODUCTS

2.1 WALL SWITCHES

A. Description:
   1. Toggle Switches: NEMA WD 1, heavy-duty, AC only general-use, quiet type snap switch with fast make-slow break, silver-cadmium oxide alloy contacts, side and back wired.
   2. Rocker Switches: NEMA WD 1, AC general use only, extra quiet type rocker switch with fast make, slow break contacts , side and back wired.

B. Device Body: White plastic with white plates, black plastic with stainless steel plates with matching switch handle.

C. Illuminated Handle Type Switch: To match device body.

D. Pilot Light: lighted handle type switch, red polycarbonate handle.

E. Voltage Rating: 120-277 volts, A.C.

F. Current Rating: 20 amperes.

G. Manufacturer: Subject to compliance with requirements, provide products by one of the following:

   1. Single-pole switch:
      a. Lutron.
      b. Leviton.
      c. Hubbel.
      d. Or approved equal.

   2. Double-pole switch:
      a. Lutron.
      b. Leviton.
      c. Hubbell.
      d. Or approved equal.

   3. Three-way switch:
      a. Lutron Nova.

b. Leviton.
c. Hubbell.
d. Or approved equal.

4. Four-way switch:
a. Lutron Nova.
b. Leviton.
c. Hubbell.
d. Or approved equal.

2.2 RECEPTACLES

A. Description: NEMA WD1, specification grade general-use receptacle.

B. Device Body: White plastic with white plates, black plastic with stainless steel plates.

C. Configuration: NEMA WD6, type as specified and indicated.

D. Convenience Receptacle: Type 5-20R.

E. Construction:
1. Nylon housing.
2. Brass contacts.
3. Solid Center rivet.
4. Back and side wiring type.

F. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Duplex convenience receptacle:
a. Lutron.
b. Leviton.
c. Hubbell.
d. Or approved equal.

2. GFCI receptacle:
a. Lutron.
b. Leviton.
c. Hubbell.
d. Or approved equal.

G. Special Receptacle: Subject to compliance with requirements, provide receptacle by one of the following:
a. Lutron
b. Leviton.
c. Hubbell.
d. Or approved equal.

2.3 WALL PLATES

A. Decorative Cover Plate: Screwless white and stainless steel (at locations as shown on the architectural drawings).

1. Manufacturer: Subject to compliance with requirements, provide product by one of the following:
   a. Lutron.
   b. Leviton.
   c. Hubbell,
   d. or approved equal.

B. Weatherproof Cover Plate: Gasketed cast metal with hinged gasket device cover.

1. Manufacturer: Subject to compliance with requirements, provide product by one of the following:
   a. Hubbell.
   b. Leviton.
   c. Arrow-Hart/Cooper.
   d. Or approved equal.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verify outlet boxes are installed at proper height.

B. Verify wall openings are neatly cut and will be completely covered by wall plates.

C. Verify floor boxes are adjusted properly.

D. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring device.

E. Verify openings in access floor are in proper locations.

3.3 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surfaces.

B. Clean debris from outlet boxes.

3.4 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install devices plumb and level.

C. Install switches with OFF position down.

D. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.

E. Do not share neutral conductor on load side of dimmers.

F. Install receptacles with grounding pole on bottom or right-hand side.

G. Connect wiring device grounding terminal to branch circuit equipment grounding conductor.

H. Install decorative plates on switch, receptacle, and blank outlets in finished areas.

I. Connect wiring devices by wrapping conductor around screw terminal.

J. Use jumbo size plates for outlets installed in masonry walls.

K. Install galvanized steel plates on outlet boxes and junction boxes in unfurnished areas, above accessible ceilings, and on surface mounted outlets.

L. Install identifying nameplate on all receptacles (including receptacles in equipment furnished by other trades as per Section 26 05 53 "Identification for Electrical Systems".

3.5 INTERFACE WITH OTHER PRODUCTS

A. Coordinate locations of outlet boxes to obtain mounting heights specified or as indicated on drawings.

B. Install wall switch 48 inches above finished floor.

C. Install convenience receptacle 24 inches above finished floor.

D. Install convenience receptacle 6 inches above counter.

E. Install dimmer 48 inches above finished floor.

F. Install telephone jack 24 inches above finished floor.

G. Install telephone jack for wall telephone 48 inches above finished floor.

3.6 FIELD QUALITY CONTROL

A. Inspect each wiring device for defects.

B. Operate each wall switch with circuit energized and verify proper operation.

C. Verify that each receptacle device is energized.

D. Test each receptacle device for proper polarity.

E. Test each GFCI receptacle device for proper operation.

3.7 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

END OF SECTION 26 27 26

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 26 28 13- FUSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes cartridge fuses, rated 600 V and less, for use in switches, switchboards, controllers and spare fuse cabinets.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: Include dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings for each fuse type indicated.

B. Product Data: Include the following for each fuse type indicated:

1. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
2. Let-through current curves for fuses with current-limiting characteristics.
3. Time-current curves, coordination charts and tables, and related data.
4. Fuse size for elevator feeders and elevator disconnect switches.

C. Maintenance Data: For fuses to include in emergency operation and maintenance manuals.

1. Include the following:

a. Let-through current curves fuses with current-limiting characteristics.
b. Time-Current curve, coordination charts and tables, and related data.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Source Limitations: Provide fuses from a single manufacturer.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70 - 2008, Article 100 and marked for intended use.

D. Comply with NEMA FU 1.

E. Comply with New York City Electrical Code - 2014.

1.6 PROJECT CONDITIONS

A. Where ambient temperature to which fuses are directly exposed is less than 40 deg or more than 100 deg F, apply manufacturer's ambient temperature adjustment factors to fuse ratings.

1.7 COORDINATION

A. Coordinate fuse ratings with HVAC and refrigeration equipment nameplate limitations of maximum fuse size.

1.8 WARRANTY

A. The manufacturer must provide a minimum one-year warranty on all fuses against manufacturing defects from the date of substantial completion.

PART 2 - PRODUCTS

2.1 FUSES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper Bussman, Inc.
2. Eagle Electric Mfg. Co., Inc.; Cooper Industries, Inc.
3. Ferraz Shawmut.
4. Or approved equal.

2.2 CARTRIDGE FUSES

A. Characteristics: NEMA FU 1, nonrenewable cartridge fuse; class and current rating indicated; voltage rating consistent with circuit voltage.

2.3 SPARE FUSE CABINET

A. Cabinet: Wall-mounted, 0.05-inch thick steel unit with full-length, recessed piano-hinged door and key-coded cam lock and pull.

1. Size: Adequate for storage of spare fuses specified with 15 percent spare capacity minimum.
2. Finish: Gray, baked enamel
3. Identification: "SPARE FUSES" in 1-1/2-inch high letters on exterior of door.
4. Fuse Pullers: For each size fuse.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.

B. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

B. Install spare fuse cabinets.

3.4 IDENTIFICATION

A. Install labels indicating fuse replacement information on inside door of each fused switch.

END OF SECTION 26 28 13

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 26 28 16.13 - ENCLOSED CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes

1. Molded-case circuit breakers (MCCBs).

B. Related Section
   1. Section 26 05 53 "Identification for Electrical System" for identification for breakers.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For circuit breakers, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
   1. Current and voltage ratings.
   2. Short-circuit current ratings (interrupting and withstand, as appropriate).
   3. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.
   4. Include time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device.

B. Shop Drawings: For circuit breakers. Include plans, elevations, sections, details, and attachments to other work.

C. Wiring Diagrams: For power wiring.

D. Qualification Data: For qualified testing agency.

E. Field quality-control reports.
   1. Test procedures used.
   2. Test results that comply with requirements.
   3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

F. Manufacturer's field service report.

G. Operation and Maintenance Data: For circuit breakers to include in operation and maintenance manuals. Include the following:
   1. Manufacturer's written instructions for testing and adjusting circuit breakers.
   2. Time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Testing Agency Qualifications: Member company of NETA or an NRTL.

C. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

D. Source Limitations: Obtain circuit breakers, components, and accessories, within same product category, from single source from single manufacturer.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70 -2008, by a qualified testing agency, and marked for intended location and application.

D. Comply with NFPA 70 -2008.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
   1. Ambient Temperature: Not less than minus 22 deg F and not exceeding 104 deg F.

B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
   1. Notify Commissioner no fewer than seven days in advance of proposed interruption of electric service.
   2. Indicate method of providing temporary electric service.
   3. Do not proceed with interruption of electric service without the Commissioner’s written permission.
   4. Comply with NFPA 70E -2008.

1.7 COORDINATION

A. Coordinate layout and installation of circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

1.8 WARRANTY

A. The manufacturer must provide a minimum one-year warranty on all enclosed circuit breakers supplied against manufacturing defects from the date of substantial completion.

PART 2 - PRODUCTS

2.1 MOLDED-CASE CIRCUIT BREAKERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
   2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
   3. Square D; a brand of Schneider Electric.
   4. Or approved equal.

B. General Requirements: Comply with UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents.

C. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits.

D. Current-Limiting Circuit Breakers: Frame sizes 200 A and smaller, and let-through ratings less than NEMA FU 1, RK-5.

E. Features and Accessories:
   1. Standard frame sizes, trip ratings, and number of poles.
   2. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material.
   3. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge lighting circuits.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine elements and surfaces to receive circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

B. Comply with NECA 1.

3.4 IDENTIFICATION

A. Comply with requirements in Section 26 05 53 "Identification for Electrical System".

B. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.

C. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.5 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

B. Acceptance Testing Preparation:
1. Test insulation resistance for each main circuit breaker, component, connecting supply, and feeder.
2. Test continuity of each circuit.

C. Tests and Inspections:
1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
3. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

D. Circuit breakers will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports, including a certified report that identifies circuit breakers. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.6 ADJUSTING

A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.

END OF SECTION 26 28 16.13

SECTION 26 28 16. 16 - ENCLOSED SWITCHES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes

1. Fusible switches.
2. Non-fusible switches.
3. Receptacle switches.
4. Shunt trip switches.
5. Enclosures.

B. Related Sections

1. Section 26 05 53 "Identification for Electrical Systems" for nameplates for switches.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated.

B. Shop Drawings: For enclosed switches and circuit breakers. Include plans, elevations, sections, details, and attachments to other work.

1. Wiring Diagrams: For power, signal, and control wiring.

C. Field quality-control reports.

D. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70 - 2008, by a qualified testing agency, and marked for intended location and application.

C. Comply with NFPA 70 -2008.

1.6 DEFINITIONS

A. NC: Normally closed.

B. NO: Normally open.

C. SPDT: Single pole, double throw.

1.7 WARRANTY

A. The manufacturer must provide a minimum one-year warranty on all enclosed switches supplied against manufacturing defects from the date of substantial completion.

PART 2 - PRODUCTS

2.1 FUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
3. Siemens Energy & Automation, Inc.
4. Square D; a brand of Schneider Electric.
5. Or approved equal.

B. Type HD, Heavy Duty, Single Throw, 240-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. Type HD, Heavy Duty, Six Pole, Single Throw, 240-V ac, 200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

D. Type HD, Heavy Duty, Double Throw, 240-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

E. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
4. Lugs: Suitable for number, size, and conductor material.
5. Service-Rated Switches: Labeled for use as service equipment.

2.2 NONFUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
3. Siemens Energy & Automation, Inc.
4. Square D; a brand of Schneider Electric.
5. Or approved equal.

B. Show pole quantities and voltage and ampere ratings of switches on Drawings.

C. Type HD, Heavy Duty, Single Throw, 240-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

D. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Lugs: Suitable for number, size, and conductor material.

2.3 ENCLOSURES

A. Enclosed Switches: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.

1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
2. Outdoor Locations: NEMA 250, Type 3R.

2.4 FUSES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Bussman.
2. Gould-Shawmut.
3. Littlefuse.
4. Or approved equal.

B. Fuses:

1. Fuses 600A and less: ANSI/UL 198E, class RK 5, sized as indicated on drawings, dual element, current limiting, time delay one-time fuse, 600-volt.
2. Interrupting rating: 200,000A RMS.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.

B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

C. Install fuses in fusible devices.

D. Comply with NECA 1 – Standard for Good Workmanship in Electrical Construction.

3.3 IDENTIFICATION

A. Comply with requirements in Section 26 05 53 "Identification for Electrical Systems."

1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Acceptance Testing Preparation:

1. Test insulation resistance for each enclosed switch and circuit breaker, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

C. Tests and Inspections:

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports, including a certified report that identifies enclosed switches and circuit breakers and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

END OF SECTION 26 28 16.16

SECTION 26 29 13 - ENCLOSED CONTROLLERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes the following enclosed controllers rated 600 V and less:

1. Full-voltage manual.
2. Full-voltage magnetic.
3. Multispeed.

B. Related Sections

1. Section 26 05 19 “Low-Voltage Electrical Power Conductors and Cables” for wiring between switches.
2. Section 26 05 29 "Hangers and Supports for Electrical Systems" for switches supports.
3. Section 26 05 53 "Identification for Electrical Systems" for switches nameplates.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Product Data: For each type of enclosed controller.

B. Shop Drawings: For each enclosed controller. Include dimensioned plans, elevations, sections, details, and required clearances and service spaces around controller enclosures.

1. Wiring Diagrams: For power, signal, and control wiring.

C. Field quality-control reports.

D. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70 - 2008, by testing agency, and marked for intended location and application.

C. Comply with NFPA 70 - 2008.

1.6 DEFINITIONS

A. CPT: Control power transformer.

B. MCCB: Molded-case circuit breaker.

C. MCP: Motor circuit protector.

D. N.C.: Normally closed.

E. N.O.: Normally open.

F. OCPD: Overcurrent protective device.

1.7 WARRANTY

A. The manufacturer must provide a minimum one-year warranty on all enclosed controllers against manufacturing defects from the date of substantial completion.

PART 2 - PRODUCTS

2.1 FULL-VOLTAGE CONTROLLERS

A. General Requirements for Full-Voltage Controllers: Comply with NEMA ICS 2, general purpose, Class A.

B. Motor-Starting Switches: "Quick-make, quick-break" toggle or push-button action; marked to show whether unit is off or on.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
    b. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
    c. Rockwell Automation, Inc.; Allen-Bradley brand.
    d. Siemens Energy & Automation, Inc.
    e. Square D; a brand of Schneider Electric.
    f. Or approved equal.

2. Configuration: Non-reversing
3. Surface mounting.
4. Pilot light.

C. Fractional Horsepower Manual Controllers: "Quick-make, quick-break" toggle or push-button action; marked to show whether unit is off, on, or tripped.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Eaton Electrical Inc.; Cutler-Hammer Business Unit.

b. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
c. Rockwell Automation, Inc.; Allen-Bradley brand.
d. Siemens Energy & Automation, Inc.
e. Square D; a brand of Schneider Electric.
f. Or approved equal.

2. Configuration: Non-reversing.
3. Overload Relays: Inverse-time-current characteristics; NEMA ICS 2, Class 10 tripping characteristics; heaters matched to nameplate full-load current of actual protected motor; external reset push button; bimetallic type or melting alloy type.
4. Surface mounting.
5. Pilot light.

D. Integral Horsepower Manual Controllers: "Quick-make, quick-break" toggle or push-button action; marked to show whether unit is off, on, or tripped.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
   b. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
   c. Rockwell Automation, Inc.; Allen-Bradley brand.
   d. Siemens Energy & Automation, Inc.
   e. Square D; a brand of Schneider Electric.
   f. Or approved equal.

2. Configuration: Non-reversing
3. Overload Relays: Inverse-time-current characteristics; NEMA ICS 2, Class 10 tripping characteristics; heaters and sensors in each phase, matched to nameplate full-load current of actual protected motor and having appropriate adjustment for duty cycle; external reset push button; bimetallic type or melting alloy type.
4. Surface mounting.
5. Pilot light.

E. Magnetic Controllers: Full voltage, across the line, electrically held.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
   b. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
   c. Rockwell Automation, Inc.; Allen-Bradley brand.
   d. Siemens Energy & Automation, Inc.
   e. Square D; a brand of Schneider Electric.
   f. Or approved equal.

2. Configuration: Nonreversing.
3. Contactor Coils: Pressure-encapsulated type.
   a. Operating Voltage: Depending on contactor NEMA size and line-voltage rating, manufacturer's standard matching control power or line voltage.

4. Power Contacts: Totally enclosed, double-break, silver-cadmium oxide; assembled to allow inspection and replacement without disturbing line or load wiring.
5. Control Circuits: 24 V ac; obtained from integral CPT, with primary and secondary fuses, of sufficient capacity to operate integral devices and remotely located pilot, indicating, and control devices.
6. Melting Alloy Overload Relays:
    a. Inverse-time-current characteristic.
    b. Class 20 tripping characteristic.
    c. Heaters in each phase matched to nameplate full-load current of actual protected motor and with appropriate adjustment for duty cycle.
7. Bimetallic Overload Relays:
    a. Inverse-time-current characteristic.
    b. Class 20 tripping characteristic.
    c. Heaters in each phase matched to nameplate full-load current of actual protected motor and with appropriate adjustment for duty cycle.
8. Solid-State Overload Relay:
    a. Switch or dial selectable for motor running overload protection.
    b. Sensors in each phase.
    c. Class 10/20 selectable tripping characteristic selected to protect motor against voltage and current unbalance and single phasing.
9. External overload reset push button.

F. Combination Magnetic Controller: Factory-assembled combination of magnetic controller, OCPD, and disconnecting means.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
    b. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
    c. Rockwell Automation, Inc.; Allen-Bradley brand.
    d. Siemens Energy & Automation, Inc.
    e. Square D; a brand of Schneider Electric.
    f. Or approved equal.

2. Fusible Disconnecting Means:
    a. NEMA KS 1, heavy-duty, horsepower-rated, fusible switch with clips or bolt pads to accommodate Class R fuses.
    b. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.
    c. Auxiliary Contacts: N.O./N.C., arranged to activate before switch blades open.

3. Nonfusible Disconnecting Means:
    a. NEMA KS 1, heavy-duty, horsepower-rated, nonfusible switch.
    b. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.
    c. Auxiliary Contacts: N.O./N.C., arranged to activate before switch blades open.

4. MCP Disconnecting Means:
    a. UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents, instantaneous-only circuit breaker with front-mounted, field-adjustable, short-circuit trip coordinated with motor locked-rotor amperes.
    b. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.
    c. Auxiliary contacts "a" and "b" arranged to activate with MCP handle.

5. MCCB Disconnecting Means:
    a. UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents; thermal-magnetic MCCB, with inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits.
    b. Front-mounted, adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
    c. Lockable Handle: Accepts three padlocks and interlocks with cover in closed position.
    d. Auxiliary contacts "a" and "b" arranged to activate with MCCB handle.

2. 2 ENCLOSURES

A. Enclosed Controllers: NEMA ICS 6, to comply with environmental conditions at installed location.

1. Dry and Clean Indoor Locations: Type 1.
2. Outdoor Locations: Type 3R
3. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: Type 12.

2.3 ACCESSORIES

A. Push Buttons, Pilot Lights, and Selector Switches: NEMA ICS 5; heavy-duty type; factory installed in controller enclosure cover unless otherwise indicated.

B. Control Relays: Auxiliary and adjustable time-delay relays.

C. Phase-Failure, Phase-Reversal, and Undervoltage and Overvoltage Relays: Solid-state sensing circuit with isolated output contacts for hard-wired connections. Provide adjustable undervoltage, overvoltage, and time-delay settings.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Wall-Mounted Controllers: Install enclosed controllers on walls with tops at uniform height, and with disconnect operating handles not higher than 79 inches above finished floor, unless otherwise indicated, and by bolting units to wall or mounting on lightweight structural-steel channels bolted to wall. For controllers not at walls, provide freestanding racks complying with Section 26 05 29 "Hangers and Supports for Electrical Systems."

B. Floor-Mounted Controllers: Install enclosed controllers on 4-inch nominal-thickness concrete base. Comply with requirements for concrete base specified in Section 03 30 00 "Cast-in-Place Concrete".

1. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around the full perimeter of concrete base.
2. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
3. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
4. Install anchor bolts to elevations required for proper attachment to supported equipment.

C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

D. Install fuses in each fusible-switch enclosed controller.

E. Install fuses in control circuits if not factory installed. Comply with requirements in Section 26 28 13 "Fuses."

F. Install heaters in thermal overload relays. Select heaters based on actual nameplate full-load amperes after motors have been installed.

G. Comply with NECA 1.

3.3 IDENTIFICATION

A. Identify enclosed controllers, components, and control wiring. Comply with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."

B. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.

C. Label each enclosure with engraved nameplate.

D. Label each enclosure-mounted control and pilot device.

3.4 CONTROL WIRING INSTALLATION

A. Install wiring between enclosed controllers and remote devices comply with requirements in Section 26 05 19 “Low-Voltage Electrical Power Conductors and Cables.”

A. Bundle, train, and support wiring in enclosures.

B. Connect selector switches and other automatic-control selection devices where applicable.

1. Connect selector switches to bypass only those manual- and automatic-control devices that have no safety functions when switch is in manual-control position.
2. Connect selector switches with enclosed-controller circuit in both manual and automatic positions for safety-type control devices such as low- and high-pressure cutouts, high-temperature cutouts, and motor overload protectors.

3.5 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Acceptance Testing Preparation:

1. Test insulation resistance for each enclosed controller, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

C. Tests and Inspections:

1. Inspect controllers, wiring, components, connections, and equipment installation.
2. Test insulation resistance for each enclosed-controller element, component, connecting motor supply, feeder, and control circuits.
3. Test continuity of each circuit.
4. Verify that voltages at controller locations are within plus or minus 10 percent of motor nameplate rated voltages. If outside this range for any motor, notify the Commissioner before starting the motor(s).
5. Test each motor for proper phase rotation.
6. Perform each electrical test and visual and mechanical inspection stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
7. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace them with new units and retest.
8. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

D. Enclosed controllers will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.6 ADJUSTING

A. Set field-adjustable switches and overload-relay pickup and trip ranges.

B. Adjust the trip settings of MCPs and thermal-magnetic circuit breakers with adjustable instantaneous trip elements. Initially adjust to six times the motor nameplate full-load ampere ratings and attempt to start motors several times, allowing for motor cooldown between starts. If tripping occurs on motor inrush, adjust settings in increments until motors start without tripping. Do not exceed eight times the motor full-load amperes (or 11 times for NEMA

Premium Efficient motors if required). Where these maximum settings do not allow starting of a motor, notify Commissioner before increasing settings.

END OF SECTION 26 29 13

SECTION 26 33 23 - CENTRAL BATTERY EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section includes

B. The electrical and mechanical characteristics and requirements for a stored electrical energy, uninterruptible, emergency power supply system.
   1. The system as specified herein includes all the components required to deliver reliable, high quality uninterruptible power for emergency illumination and related life safety equipment.
   2. The system must incorporate an online, dual conversion, advanced DSP controlled, high frequency, IGBT PWM rectifier/charger and inverter, high speed automatic bypass transfer device, battery charging system, energy storage battery platform, a diagnostic monitoring display panel, and all the related hardware components and software to facilitate a functional centralized system. The emergency power supply system must provide immunity from all line disturbances and power interruptions.
   3. The system includes an uninterrupted, normally on output power section and a normally off standby output power section, thus enabling compatibility with emergency lighting fixtures operating in normally on and standby mode(s). A self-diagnostic monitoring alarm system continuously advises of system status and battery condition.

C. Related Sections
   1. Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables" for wiring.
   2. Section 26 05 26 "Grounding and Bonding for Electrical Systems" for equipment grounding.
   3. Section 26 05 53 "Identification for Electrical Systems" for equipment identification.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Manufacturer Requirements:
   1. The manufacturer must be ISO 9001:2008 “Quality Assurance Certified” and must upon request furnish certification documents.
   2. The manufacturer must have minimum three years experience in design and fabrication of centralized stored electrical energy emergency and standby power systems.

B. Product Data:

1. The manufacturer must supply documentation for the installation of the system, including wiring diagrams and cabinet outlines showing dimensions, weights, BTUs, input/output current, input/output connection locations and required clearances.
2. Factory test results must be provided to show compliance with the requirements. The manufacturer must include battery test documentation which demonstrates compliance with the specified minimum emergency reserve with full rated KW load.
3. The supplier must furnish three equipment submittal copies. Submittals must be specific for the equipment furnished and must include as-built information.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.6 REFERENCE STANDARDS

A. The system must be designed in accordance with applicable portions of the following standards:

1. American National Standards Institute (ANSI C57.110)
2. Institute of Electrical and Electronic Engineers (IEEE 519-1992) (C62.41-1991)
3. National Electrical Manufacturers Association (NEMA PE-1)
4. National Electric Code (NEC 2005, Article 700)
5. National Fire Protection Association (NFPA 70) (NFPA 101) (NFPA 111)
6. Underwriters Laboratories (UL 924)
7. Federal Communications Commission (FCC Part 15, Sec. J, Class A)
8. Federal Aviation Administration (FAA-G-201e)
9. Listed UL Standards UL 924 Emergency Lighting Equipment with 90 minutes

1.7 WARRANTY

A. The manufacturer must guarantee all power component and system electronics to be free from defects in material and workmanship for a period of 2 years following substantital completion.

B. Battery warranty must be 1 year full replacement, 14 year prorated following substantial completion.

1.8 SERVICEABILITY

A. The inverter’s power section, including all control cards and system electronics, must be front-accessible and located behind a secure hinged access door for ease of service or component replacement. An integral inverter bypass switch must be provided. A DC circuit breaker and DC Anderson connector must be incorporated into the design to facilitate rapid replacement of the batteries via the front of the system enclosure. No side access must be required. To facilitate inverter diagnostics and programming, a DB9 and USB communications port must be provided for access to electrical measurements, system set points, and system logs.

PART 2 - PRODUCTS

2.1 GENERAL

A. Central Battery Equipment.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Controlled Power Company.
   b. Core Power and Envoronment.
   c. Power management Systems, inc.
   d. Or approved equal.

2.2 MANUFACTURED UNITS

A. The system must be designed and manufactured to assure maximum reliability, serviceability and performance. All control devices and system electronics must be accessible via the front inverter cabinet for rapid service or replacement. The diagnostic monitor panel display must be mounted on the front of the system for easy observation of system status and battery condition. The system is to be furnished with an internally located AC input circuit breaker and up to 12 output circuit breakers as specified. The battery and DC conductors must be DC circuit breaker protected. All conductors and transformer windings must be copper constructed. The installed system must be floor mounted and wall secured, constructed of steel, with the inverter controls, bypass, and breakers being front accessible through a hinged door, requiring a hand tool for access. The installed inverter cabinet must be designed to meet NEMA 2 standards, rated for indoor use.

B. The system must operate in accordance with requirements as specified herein to support LED or HID fixtures or other approved loads up to the rating of the system. “Normally on” and “Normally off” AC output bus must be 100% rated and limited only by the system’s maximum KW output rating.

C. Normal Operation: The load is supplied with regulated power derived from the normal AC power input terminals through the rectifier charger and inverter. The rectifier charger must be fully rated to charge the batteries and supply sufficient DC energy for the inverter when under full load. The battery must be connected in parallel with the rectifier charger output.

D. Uninterrupted Emergency Operation: Upon the failure or unacceptable deviation of commercial AC power, energy will be supplied by the battery through the inverter and continue to supply power to the load without switching loss or disturbance. When power is restored at the AC input terminals of the system, the rectifier charger must continue to supply power to the load through the inverter and simultaneously recharge the batteries. There must be no break or interruption of power to the load upon failure or restoration of the commercial AC power.

E. Standby Emergency Operation: Upon the failure or unacceptable deviation of commercial AC power or upon a remote input “command on signal”, the standby, normally off AC output section of the system must become energized, thus providing emergency power for standby lighting fixtures which are required to illuminate only in the event of emergency. User-adjustable settings must include transfer on delay time (0 to 8 seconds), transfer off delay time (0 to 15 minutes), and a soft start control (0 to 172 cycles) to accommodate the high inrush

current associated with energizing normally off emergency lights, compatible with various lighting types and manufacturers.

F. Automatic Bypass Operation: The system must include a high speed automatic bypass for fault clearing, for instantaneous overload conditions and/or to connect the load to the normal utility source in the event of a system rectifier charger or inverter failure.

G. Manual Bypass Switch: The system must include an integral inverter bypass switch for use in case of an inverter failure. The switch must be accessible via the front of the inverter enclosure, through a hinged door, requiring a hand tool for access. When in the bypass position, the switch must bypass the inverter power control electronics and divert utility power to the inverter's normally on output bus.

H. System Power Output Capability: The stored emergency power supply system output power rating must be 2000 watts.

I. Battery Time Reserve Capacity: Battery must be capable of producing emergency power for 90 minutes at full rated watts.

J. Reliability: MTBF 100,000 hours. MTTR, 1 hour typical.

K. System Input Breaker Rating: Input breaker must be sized to accommodate full rated load, low line input, and maximum recharge current simultaneously 2000 watt unit – 30A @ 120 VAC.

2.3 INPUT SPECIFICATIONS

A. Input Voltage: 120 VAC

B. Input Voltage Operating Range: +12% to -15% at full load without battery usage.

C. Extended Range: The unit must incorporate the use of variable range logic in conjunction with the load percentage to extend the input range up to +12% to -30%, without battery usage, while maintaining a regulated output voltage.

D. Frequency Range: 57.5 hertz to 62.5 hertz.

E. Power Factor: Self correcting to >0.97 (approaching unity).

F. Input Current Harmonics: <5% THD (total harmonic distortion).

G. System AIC (Amperes Interrupting Current) Rating: 10kAIC.

2.4 OUTPUT SPECIFICATIONS

A. Output Voltage: 120 VAC.

B. Sine Wave Voltage: Maximum 3% THD under linear load.

C. Frequency: 60 hertz + 0.5% under full load while in the battery operation mode.

D. Harmonic Attenuation: Reflected load generated harmonics must be attenuated at the input.

E. Voltage Regulation: +/-2%.

F. Output Power Rating: KVA at 1.0 power factor (unity). KVA = KW

2.5 BATTERY SPECIFICATIONS

A. Battery time: 90 Minutes at full rated kilowatt output, UL 924 listed Emergency Lighting Equipment.

B. Battery Type: Integral, valve regulated, sealed lead calcium, maintenance free.

C. Charger: 4 stage, 400 watts, temperature compensated, smart charge.

D. Recharge Time: UL 924, NFPA 101 compliant, 24 hour recharge.

E. Bus Voltage: 72 VDC.

2.6 PERFORMANCE SPECIFICATIONS

A. Overload Rating (without use of static bypass): Up to 102% continuous, 125% for 30 cycles, 150% for 4 cycles when fed from the AC power source, or on battery.

B. LED Inrush Rating (without use of static bypass): Peak overload capability of 1200% during a current surge of ¼ cycle, when fed from the AC power source or on battery, to accommodate inrush current from LED fixtures/drivers.

C. Fault Clearing (with bypass available): 150% for 1 minute, 500% for 1 second, 1000% for 1 cycle.

D. Normally Off Bus Output with User-Progammable Soft-Start: Adjustable settings must be provided to limit the high inrush current, associated with energizing normally off emergency lights, to within the inverter's on battery overload rating.

E. Voltage Regulation: The output voltage must be regulated to within ±2% during input voltage changes from +12% to -15% with reference to nominal, and when the output is loaded from no load to full rated load.

F. Reactive Power Correction: Load at .6 pF corrected to > 0.97 at input (automatically correcting).

G. Efficiency: 88% typical under full rated load.

H. Reliability: 100,000 hours MTBF.

2.7 ENVIRONMENTAL SPECIFICATIONS

A. Operating Temperature: 20°C to 35°C for UL 924 Listed models – Emergency Lighting Equipment. Optimum battery performance and life must be achieved at 25°C. Inverter electronics must be designed for use at 0°C to 40°C.

B. Inverter Storage Temperature: -20°C to 50°C.

C. Battery Storage Temperature: 25°C for 6 months. For each 9°C rise, reduce storage time by half.

D. Relative Humidity: 95% non-condensing.

E. Elevation: 5,000 feet, 1,500 meters.

F. Weight and Cabinet Sizes for UL 924 Listed models with 90 Minutes:

Rating / Voltage	Weight (lb.)	Dimensions W x D x H
2000 / 120 - 120	534	22” x 11.75” x 50”

G. Audible Noise Level: Not greater than 50 dba at 3 feet.

H. Enclosure: NEMA 2, powder-coat painted steel construction, drip-proof, and sealed prohibiting rodent entry.

2.8 DISPLAY MONITOR AND DIAGNOSTICS

A. Display Panel – System must include a local, front mounted, sealed, LED display panel to indicate system status and battery condition. Display must include provisions to automatically monitor inverter input voltage normal, inverter input voltage high, inverter input voltage low, inverter on automatic bypass, % load, battery in use, battery full charge, battery low and check battery.

B. Audible Alarm – The display panel includes an audible alarm with alarm silence for system on battery, low battery, check battery, over temperature warning, system fault and inverter overload.

C. Control Functions – Push button for inverter on, fail safe dual push buttons for inverter off, alarm silence push button and push button for manually initiating a system battery test.

D. Communications Port (RS232) – Include a DB9 and USB communications port for remote monitoring access to electrical measurements, system set point programming and system logs.

E. Electrical Measurements (RS232) – Electrical measurements must include: input voltage L1-neutral, output voltage L1-neutral, output current (amps), output watts, output volt amperes, % load, battery voltage and DC charging current, and output frequency.

F. System Set Points (RS232) – Include provision to program the following: low battery alarm, battery usage, automatic battery tests programmable for 30 day intervals, or 90 day intervals and an annual discharge test. The start date and time of the 30, or 90 day test selected and of the annual test (365 day interval) must be programmable via the RS232 connection (DB9 or USB port). The time duration of the automatic battery test must be programmable (30 seconds or 5 minutes).

G. System Log (RS232) – System must include provisions to log power outages, system overloads and battery test pass/fail results, all with a date and time stamp.
Automatic Self-Testing – Systems must provide a programmable 5 minute automatic battery test that can be programmed to occur every 30, or 90 days.

2.9 RELAY COMMUNICATIONS INTERFACE

A. Status / Alarm relay interface normally open contacts must be provided for optional remote annunciator panel or automatic message dialer. Include potential free, 120 VAC @ .5amps, contacts for inverter on battery, low battery warning, and general alarm.

B. A normally closed Battery Test Active contact must be provided that opens during automatic or manual system testing. This contact must be used to signal one or more UL924 listed shunt relays to bypass local control devices during periodic and annual NFPA-mandated tests, in order to provide emergency power to designated emergency lighting fixtures.

2.10 ACCESSORIES

A. Include three control device (dimmer control, wall switch, occupancy sensor) override(s) for use with normally on inverter output bus to provide full illumination to designated emergency lights upon the failure or loss of commercial AC power.

B. Include one zone sensing device(s) to sense voltage at individual zone lighting panels. The sensing device must detect loss of power at the panel and must signal the system to illuminate emergency fixtures within the specific zone only. If commercial AC power is acceptable at other zones, emergency lighting must remain in the standby mode.

C. Include network device adapter for network communication of inverter system status, electrical measurement data, and automatic battery pass / fail test results with time and date stamp.

D. Include pre-installed, single pole, output circuit breakers

1. 15 Amp (normally off) for emergency lighting
2. 15 Amp, Switched output for exterior lightg (switched via photocell ot timeclock)
3. 15 Amp (normally on) , continuously illuminated exit lighting

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine areas and conditions for compliance with requirements for ventilation, temperature, humidity, and other conditions affecting performance.

1. Verify that manufacturer's written instructions for environmental conditions have been permanently established in spaces where equipment will be installed, before installation begins.
2. Examine roughing-in for electrical connections to verify actual locations of connections before installation.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Install wall mounted system components. Do not attach directly to walls. Attach by bolting to steel channels.

B. Install floor mounted system components on concrete base and attach by bolting

C. Maintain minimum clearances and workspace at equipment according to manufacturer's written instructions and NFPA 70 – 2008.

3.4 CONNECTIONS

A. Interconnect system components. Make connections to supply and load circuits according to manufacturer's wiring diagrams, unless otherwise indicated.

1. Provide wiring between unit and remote status monitoring panel.

B. Ground equipment according to Section 26 05 26 "Grounding and Bonding for Electrical Systems."

1. Separately Derived Systems: Make grounding connections to grounding electrodes and bonding connections to metallic piping systems as indicated; comply with NFPA 70.C - 2008.

C. Connect wiring according to Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."

3.5 IDENTIFICATION

A. Identify equipment and components according to Section 26 05 53 "Identification for Electrical Systems."

3.6 STARTUP

A. Verify that central battery inverter is installed and connected according to the Contract Documents.

B. Verify that electrical wiring installation complies with manufacturer's submittal and installation requirements.

C. Complete installation and startup checks according to manufacturer's written instructions.

3.7 DEMONSTRATION

A. Engage a factory-authorized service representative to instruct the City of New York’s personnel to adjust, operate, and maintain central battery inverters.

END OF SECTION 26 33 23

SECTION 26 43 13 – SURGE PROTECTIVE DEVICES FOR LOW-VOLTAGE ELECTRICAL POWER CIRCUITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section includes field-mounted surge protection device for installation on low-voltage, 120 to 480 Volt power distribution equipment.

B. Related Sections:
1. Section 26 05 19 "Low Voltage Electrical Power Conductors and Cables".
2. Section 26 05 26 "Grounding and Bonding for Electrical Systems".

1.3 DEFINITIONS

A. ATS: Acceptance Testing Specifications.

B. SPD: Surge Protective Device(s), both singular and plural.

C. SVR: Suppressed voltage rating.

D. TVSS: Transient voltage surge suppressor(s), both singular and plural; also, transient voltage surge suppression.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating weights, electrical characteristics, furnished specialties, and accessories.

B. Verification that all SPD are UL tested and labeled with 20kA (In) nominal discharge rating for compliance to UL96A Lightning Protection Master Label and NFPA 780.

C. Product Certificates: For SPD devices, from manufacturer.

D. Field quality-control reports.

E. Warranties: Sample of special warranties.

F. Operation and Maintenance Data: For SPD devices to include in emergency, operation, and maintenance manuals

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by UL and marked for intended location and application.

C. Comply with IEEE C62.41.2 and test devices according to IEEE C62.45.

D. Comply with NFPA 780.

E. Comply with NEMA LS 1.

F. Comply with UL 1449 and UL 1283 (Type 2 only).

G. Comply with NFPA 70.

H. Comply with FM Global requirements.

1.7 PROJECT CONDITIONS

A. Service Conditions: Rate SPD devices for continuous operation under the following conditions unless otherwise indicated:
   1. Maximum Continuous Operating Voltage: Not less than 115 percent of nominal system operating voltage.
   2. Operating Temperature: 30 to 120 deg F (0 to 50 deg C).
   3. Humidity: 0 to 85 percent, non-condensing.

1.8 COORDINATION

A. Coordinate location of field-mounted SPD devices to allow adequate clearances for maintenance, minimum 36” in front and 12” from centerline.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of surge suppressors that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Ten years from date of substantial completion.

PART 2 - PRODUCTS

2.1 SERVICE ENTRANCE and TRANSFER SWITCH SUPPRESSORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Current Technology Inc.; Danaher Power Solutions.
   2. Eaton Electrical Inc.
   3. Siemens Industry Inc.
   4. Or approved equal.

B. Surge Protection Devices Installed in new Service Entrance Substations:

1. Type 1, Complying with UL 1449, 3rd edition, with UL card.
2. SPD relying upon external or supplementary installed safety overcurrent protection do not meet the intent of this specification.
3. Arranged for copper bus bar connections to phase buses, neutral bus, and ground bus.
4. A three-pole circuit breaker for dedicated disconnecting means must be provided in the switchgear.
5. LED indicator lights for power and protection status.
6. Audible alarm, with silencing switch, to indicate when protection has failed.
7. Form-C contacts rated at 5 Amp and 250-VAC, one normally open and one normally closed. Contacts must reverse on failure of any surge diversion module or on opening of any current-limiting device.
8. Six-digit transient-event counter set to totalize transient surges.

C. Comply with UL 1283.

D. Minimum Surge Current Capacity Rating: 300 kA per phase.

E. Nominal discharge current (In): 20 kA.

F. Short circuit current rating (SCCR): 200 kA.

G. Maximum Continuous Operating Voltage (MCOV):

1. 480/277 V: 320 V.
2. 208/120 V: 150 V.

H. UL 1449 VPR for grounded wye circuits with 208Y/120 V, 3-phase, 4-wire circuits must be as follows:

1. Line to Neutral: 700 V for 208Y/120 V.
2. Line to Ground: 700 V for 208Y/120 V.
3. Neutral to Ground: 700 V for 208Y/120 V.
4. Line to Line: 1200 V for 208/120 V.

2.2 DISTRIBUTION SWITCHBOARDS AND PANELBOARD SUPPRESSORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Current Technology Inc.
2. Eaton Electrical Inc.
3. Siemens Industry Inc.
4. Or approved equal.

B. Products must be installed external to new or existing distribution and branch panel equipment. SPD must have the same or greater AIC, Interrupting, or Fault rating of the equipment the SPD is protecting.

C. Surge Protection Devices:
1. Type 2, Comply with UL 1449, 3rd edition with UL card.
2. Externally mounted.

3. Short-circuit current rating complying with UL 1449, and matching or exceeding the equipment short-circuit rating and redundant suppression circuits; with individually fused metal-oxide varistors.
4. SPD relying upon external or supplementary installed safety overcurrent protection do not meet the intent of this specification.
5. Fabrication using bolted compression lugs for internal wiring.
6. An integral safety interlocked disconnect switch with an externally mounted manual operator.
7. Arrangement with wire connections to phase buses, neutral bus, and ground bus.
8. LED indicator lights for power and protection status.
9. Audible alarm, with silencing switch, to indicate when protection has failed.
10. Form-C contacts rated at 5 Amp and 250-VAC, one normally open and one normally closed. Contacts must reverse on failure of any surge diversion module or on opening of any current-limiting device.
11. Six-digit transient-event counter set to totalize transient surges.

D. Comply with UL 1283.

E. Minimum Surge Current Capacity Rating:
1. LV switchgear, Switchboards, Distribution panels: minimum 200 kA.
2. Branch Circuit Panelboards: minimum 100 kA.

F. Nominal discharge current (In): 20 kA.

G. Short circuit current rating (SCCR): 200 kA.

H. Maximum Continuous Operating Voltage (MCOV):
1. 480/277 V: 320 V.
2. 208/120 V: 150 V.

I. UL 1449 VPR for grounded wye circuits with 208Y/120 V, 3-phase, 4-wire circuits must be as follows:
1. Line to Neutral:700 V for 208Y/120 V
2. Line to Ground: 700 V for 208Y/120 V.
3. Neutral to Ground: 700 V for 208Y/120 V.
4. Line to Line: 1200 V for 208/120 V.

2.3 ENCLOSURES

A. Indoor Enclosures: NEMA 250, Type 1.

B. Outdoor Enclosures: NEMA 250, Type 3R.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Type 1 SPD devices at service entrance Secondary Unit Substations must be installed on the line side with ground lead bonded to service entrance ground.

B. Install Type 2 SPD devices for new or existing distribution switchgear, switchboards and panelboards externally with conductors or buses between suppressor and points of attachment as short and straight as possible. Do not exceed manufacturer's recommended lead length. Do not bond neutral and ground.
   1. Provide a three pole circuit breaker as a dedicated disconnecting means for each SPD unless otherwise indicated. Disconnecting means must occupy the first three spaces in existing equipment; adjust circuit-breaker positions to achieve shortest and straightest leads.
   2. Use crimped connectors and splices only. Wire nuts are unacceptable.

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections.
   1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:
   1. Perform each visual and mechanical inspection and electrical test stated in NETA ATS, "Surge Arresters, Low-Voltage Surge Protection Devices" Section. Certify compliance with test parameters.
   2. After installing SPD devices but before electrical circuitry has been energized, test for compliance with requirements.
   3. Complete startup checks according to manufacturer's written instructions.

C. SPD device will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports, submit to Commissioner.

3.4 STARTUP SERVICE

A. Do not energize or connect service entrance equipment, distribution equipment, or panelboards to their sources until SPD devices are installed and connected.

B. Do not perform insulation resistance tests of the distribution wiring equipment with the SPD installed. Disconnect before conducting insulation resistance tests, and reconnect immediately after the testing is over.

3.5 DEMONSTRATION

A. Instruct the New York City’s attendees to maintain SPD devices.

END OF SECTION 26 43 13

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 26 50 00 –LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Furnishing Interior and Exterior light fixtures and luminaires.

B. Related Sections:

1. Section 26 05 00 "Common Work Results for Electrical".
2. Section 26 09 23 "Lighting Control Devices".

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 "Submittal Procedures."

1.4 SUBMITTALS

A. General: Shop drawings, samples, test data and certificates are to be submitted for approval in accordance with the requirements of the Contract Documents. Fixtures or other materials must not be shipped, stored or installed into the work unless prior approval has been received, based upon the submittal of shop drawings, samples, catalogue cuts, test data, certificates or other material submitted for approval. Make modifications to fixtures in accordance with Commissioner's comments concerning submittals, as a part of the work of this Section.

B. Submittal Schedule:

1. Within 30 calendar days after the award of Contract, a List of Intended Manufacturers and estimated fabrication lead times to be submitted to the Commissioner. "Lead times" to be measured in weeks, beginning from the manufacturer's receipt of approved shop drawings and release, and ending at shipment. Commissioner to approve or disapprove each manufacturer.
2. Within 15 days after Contractor's receipt of Commissioner's response to the List of Intended Manufacturers, copies of purchase orders and manufacturers' acknowledgments for all fixtures specified, conforming to Commissioner's responses, to be forwarded to Commissioner.
3. No orders are to be placed before approval of submittals and shop drawings.

4. Within 15 days after receipt of “approved” or “approved as noted” shop drawings, Contractor to forward to Commissioner a warranted shipment date for each specified fixture, as well as forwarding samples, texts, or any outstanding data required for approval.
5. Within 15 days after Contractor's receipt of disapproved shop drawings, revised shop drawings to be resubmitted to Commissioner.
6. Contractor to call to the attention of Commissioner any submittals that have not been returned in a timely manner and that might affect the appropriate delivery of fixtures.

C. Shop Drawings:

1. Submit shop drawings for each type of fixture, except where specified fixtures are standard, unmodified, “off-the-shelf” units, fully described by catalog cuts. If allowed by Commissioner, such catalog cuts may be substituted for shop drawings.
2. Indicate on shop drawings, materials, finishes, metal gauges, overall and detail dimensions, sizes, electrical and mechanical connections, fasteners, welds, joints, end conditions, provisions for the work of other trades, and similar information. Include pertinent mounting details including hung ceiling construction. Indicate complete details of the fixture, including manufacturer's catalog numbers for sockets, ballasts, light shields, switches and type of wiring, and targeting and locking devices for adjustable fixtures.
3. Shop drawings for all lighting equipment must include details and cuts of each fixture type, and must include information on lamp, housing size and material, driver or ballast or transformer type (where applicable), complete photometry report, lenses, baffles, finishes, and means and methods of attachment and support, joining, and electrical connection.

    a. In addition, shop drawings for continuous or custom length lighting equipment require field dimensions, and shop drawings must include field dimensions and layouts.
    b. When operable fixture or finish sample requested for review, said materials must be considered a part of the "Shop Drawing Submittal".

D. Manufacturer's Catalogue Sheets must indicate input and load electrical characteristics, ambient temperature rating, noise level rating, mounting methods and UL listing for use with required lamp.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 “Quality Requirements.”

B. Regulatory Agencies:

1. Provide fixtures constructed, wired, and installed in compliance with the current edition of the New York City, and New York State electrical codes. Provide fixtures conforming to Underwriters Laboratories Standards, and to provisions of applicable codes which exceed those standards. In addition, provide fixtures that conform to additional regulations necessary to obtain approval for use of specified fixtures in locations shown. Use only electrical components listed by Underwriters Laboratories.

2. Particular attention is called to Article 410 of the National Electric Code. Provide only fixtures that meet these requirements, as interpreted by New York City Building Department. As manufacturers' catalog numbers may not include thermal protection devices, it is Contractor's responsibility to coordinate the fixture provided with the ceiling construction in accordance with NYC Building Code enforcement practice.

C. Recognized Standards:
1. Underwriters Laboratories (UL)
2. National Electrical Code (NEC)
3. Certified Ballast Manufacturers Association (CBM)
4. Illuminating Engineering Society (IES)
5. American Society for Testing and Materials (ASTM)
6. American National Standards Institute (ANSI)

1.6 DELIVERY, STORAGE, AND HANDLING

A. Lighting fixtures and their component elements to be delivered to the job site factory-assembled and wired to the greatest extent practical, in strict accordance with the approved shop drawings, samples, certificates, and catalog cuts, and must be handled in a careful manner to avoid damage.

B. Exposed finishes to be protected during manufacture, transport, storage, and handling. Delivered materials to be identical to the approved samples. Materials that become damaged to be repaired and/or replaced as directed.

C. Fixtures are to be stored under cover, above the ground, in clean, dry areas, and to be tagged and/or marked as to type and location.

PART 2 - PRODUCTS

2.1 GENERAL

A. Provide materials, equipment, appurtenances and workmanship for the work of this Section conforming to the highest commercial standards, as specified and indicated on the drawings. Make fixture parts and components not specifically identified or indicated on the drawings, of materials most appropriate to their use or function, and resistant to corrosion and to thermal and mechanical stresses encountered in the normal application and function of the fixtures.

2.2 FIXTURE DESCRIPTIONS

A. Provide fixtures that conform to the above standards and criteria, as indicated on the following specifications. Contractor to verify ceiling and attachment conditions for all fixture types.

B. Catalogue or series numbers shown, are intended to provide assistance in establishing a general type or category of lighting fixtures. They are not part to be used to order fixtures.

C. "Focusing Required", when noted, requires Contractor to provide allowance for manpower, scaffolding, and tools to adjust, aim, or install fixtures and accessories per the Commissioner's

direction during evening hours. Focusing can only occur after installation and confirmed operation of all fixtures, and the Contractor has verified installation and confirmed operation of control systems. Installation of specific architectural ornament or art intended to be illuminated must be in place.

1. When known initial aiming angles are defined above. However, these "initial" aiming angles will be verified in the field by the Commissioner and may require additional re-aiming for final focusing.
2. During final focusing the Commissioner will provide aiming direction, instruction, and define aiming angles for typical fixtures so the contractor may complete the focusing during day hours. The Contractor is to lock but not over-tighten all fixtures so that lampholders will not move during subsequent relamping.

D. "Remote Transformers", when noted, required the fixture manufacturer or the Electrical Contractor to supply low voltage transformers and power supplies within enclosures and to coordinate size and quantity with the Electrical Contractor (or manufacturer).

1. Coordinate mounting details and electrical connections, advise manufacturer of lead lengths, and verify that installation complies with national and NYC Electrical Code, and provide fuse for secondary wiring, when required.
2. Fixture manufacturer to determine required wire size between fixtures and remote low voltage transformers, number of lamps per circuit, and to assure that voltage drop does not exceed 5% - verification of voltage drop must to conducted on site using a “true RMS” voltmeter to measure the secondary voltage.
3. Fixture manufacture to provide installation instructions for wiring, mounting, and location requirements for remote transformers or remote power supplies.
4. Transformers must be in a well ventilated and accessible remote location as selected by the Commissioner. Contractor to coordinate mounting details and electrical connections, advise manufacturer of lead lengths, and verify that installation complies with New York City Electrical Code.

E. Catalogue or series numbers are intended to provide assistance in establishing identification of manufactures model, series, or fixture style, and may not be complete and must never be used to order fixtures. Manufacture’s catalog cuts are subject to change and any discrepancies between the catalog number, fixture description, remarks, lamp and supply voltage, and architectural drawings must be brought to the attention to the Commissioner prior to the release of a purchase order.

F. "Custom Color", when noted, requires the Contractor to coordinate and provide special colors. Contractor to verify all occurrences with the Commissioner, and note identical fixtures types may be installed at different architectural ceiling or wall finishes, thus separate colors for each material may be required. Include within cost additional set-up charges for "custom colors".

G. "Control Note", when noted, indicates if fixture is "dimmable" or "non-dimmable", and the type of dimmer required. (Dimming may be or may not be required.) Refer to electrical control drawings for control device (such as switch, occupancy sensor, vacancy sensor, or dimmer) to be provided by the contractor. Contractor to note when 2-wire, 2-wire with neutral, or 4-wire wiring between fixtures and dimmers is required. Confirmation of dimmer type must be confirmed with final approved shop drawings.

H. Commissioning or Programming of controls, when noted, requires contractor to provide full on-site commissioning and programming by the manufactures field technician to review the installation, ensure with the electrician the system is operating properly, and provide full programming with the Commissioner.

I. “Flangeless” or “Trimless” or “Flush”, when noted, requires contractor to refer to manufactures installation instructions for plaster frame. Proper alignment of bottom of aperture throat with face of finished ceiling is critical for installation; contractor to coordinate.

J. "Continuous", when noted, requires butted end to end layouts with no gaps between fixture housings. Note minimum or maximum socket overlapping, allowed gap of no fixture at end walls, or layout when provided.

2.3 FIRE PROTECTION ENCLOSURES

A. Provide fire protection enclosure which provides a minimum of ¾ hour fire rating for light fixture types indicated. Provide dome-shaped lightweight flexible cover UL-rated for IC fixtures. Use manufacturer recommended attachments and clearances.

2.4 REMOTE TRANSFORMERS

A. Provide remote transformers when noted, coordinate mounting details and electrical connections, and verify compliance with New York City electrical code. Assure that voltage drop does not exceed 5% utilizing a “true RMS” voltmeter to measure the secondary voltage.

B. Provide appropriate wire size required between fixture and remote low voltage transformer and confirm number of lamps per circuit.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL

A. Install fixtures complete with lamps, as indicated, and with equipment, materials, parts, attachments, devices, hardware, hangers, cables, supports, channels, frames and brackets necessary to make a safe, complete, and fully operative installation.

B. Verify and provide fixtures that are appropriate for the ceiling and mounting conditions of the project.

C. Reject and do not install blemished damaged or unsatisfactory fixtures. Replace imperfect or unsatisfactory fixtures, if installed, as directed by Commissioner.

D. Set fixtures, when installed, to be true, and free of light leaks, warps, dents, or other irregularities. No light leaks are permitted at the ceiling line or from any visible part or joint of the fixtures.

E. Provide finish for exposed parts or trims as specified so indicated, provide a finish as directed by Commissioner.

F. Do not install reflector cones, aperture plates, lenses, diffusers, louvers, and decorative elements of fixtures until completion of wet work, plastering, painting and general clean-up in the area of the fixtures.

G. Mount fixtures at heights and locations indicated on the Contract Drawings, or as required by Commissioner.

H. In Mechanical Equipment Rooms, lighting fixtures to be installed on ceilings after piping and equipment therein has been installed. Exact locations for such fixtures to be determined at the job site during the course of the Work, in co-ordination with the Mechanical Work.

I. Adequately protect the housing of recessed lighting fixtures during installation by internal blocking or framing to prevent distortion of sides, or dislocation of threaded lugs, which, upon completion, to be in perfect alignment and match the corresponding holes in frames or rims. Holding screws to be inserted freely without forcing, and to remain easily removable for servicing. Threads intended to receive holding installation and removal of knurled headed screws.

J. Upon completion of the installation, the lighting fixtures and lighting equipment to be in first class operating order and free from defects in condition and finish. At time of final inspection, all fixtures and equipment to be clean, fully lamped, and be complete with required lenses or diffusers, reflectors, side panels, louvers, or other components necessary for the function of the fixtures. Any reflectors, lenses, diffusers, side panels or other parts damaged prior to the final inspection to be replaced by Contractor prior to inspection.

3.3 ACCESSIBILITY

A. Install equipment such as junction and pull boxes, fixture housings, transformers, ballasts, switches and controls, and other apparatus that to be reached from time to time for operation and maintenance, to be easily accessible and appropriate for mounting and ceiling conditions.

3.4 SUPPORTS

A. Provide necessary hardware with fixtures, such as stems, plates, plaster frames, hangers and similar items, for safe support of the fixture. Provide plaster frames made of non-ferrous metal, or of steel that has been suitably rust-proofed after fabrication, as described above.

B. Provide supports for fixtures that are adequate to support the weight of the fixtures.

C. Provide visible hanging devices that are finished to match the fixture finish, unless indicated otherwise.

D. Where necessary to meet fire resistance requirements as noted, provide enclosures housing recessed fixtures that are constructed to provide required fire resistance rating.

E. Provide attachment devices including brackets, cast metal shapes with the requisite rigidity and strength to maintain continuous alignment of installed fixtures. Attach fixtures to ceiling supporting members, and do not depend upon lathing, plaster or ceiling tile for alignment or support.

F. Provide fixtures mounted in suspended ceilings that are supported by saddle hangers or the bars attached to runners or between crossbars of ceiling systems. Provide mounting splines or other positive means of maintaining alignment and rigidity.

G. Provide supporting members that are surface passivity, and which are primed or paint-dipped to resist corrosion.

H. Provide fastening devices of a positive locking type, which do not require special tools to apply or remove them. Do not use tie wires in place of fastening devices.

I. Contractor to confirm the suspension system; Contractor to ascertain the structural reliability of supports provided under other Sections of the specification.

J. Attach reflectors to housings by means of safety chains, which must prevent reflectors from falling. No part of the chain may be visible after installation, when viewed from any angle up to 45 degrees from the horizontal.

K. Provide pendant or surface mounted fixtures with required mounting devices and accessories, including hickeys, stud-extensions, ball aligners, canopies, and stems. Uniformly maintain the fixture heights shown on the Contract Drawings or established in the field. The allowable tolerances in individual fixture mounting to not exceed 1/4 inch and may not vary more than 1/2 inch from the floor mounting height shown on the drawings. Install fixtures hung in continuous runs absolutely level, and in line with each other. Hanging devices to comply with code requirements.

L. Provide hanging devices which, if visible from normal viewing angles, exactly match fixture finishes.

M. Provide an approved ceiling canopy for each stem, exactly matching fixture finishes.

N. Place stems to be vertical.

O. Provide at least two supports for individually mounted fluorescent fixtures. Where fixtures are ganged, provide supports at 8 ft. intervals, unless otherwise indicated.

3.5 CLEANING

A. Immediately prior to occupancy, clean reflector cones, reflectors, aperture plates, lenses, louvers, lamps and decorative elements. Destaticize lenses after cleaning, installing them to leave no finger or dirt marks.

B. Upon completion of the fixture installation and at the time of final inspection, fixtures to be clean, and free from marks, dust, spotting or other defects. Replace any broken or defective parts prior to final inspection. Replace or make good all defects revealed by final inspection.

END OF SECTION 26 50 00

SECTION 27 10 00 – STRUCTURED CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Work of this Section includes all labor, materials, equipment and services necessary to complete the provision of voice and data telecommunication system cabling related work indicated on the ITS drawings and specified in this Section.

B. Work includes, but is not necessarily limited to, the following:

1. Back boxes, conduit, conduit sleeves, cable trays and wiring devices for the voice, data systems indicated on the ITS drawings along with network hardware specified.
2. All conduit must be concealed in occupied spaces of the project. No free air cabling will be permitted except above accessible finished ceilings.
3. Provision of CAT 6A plenum cable, patch panels, patch cords, equipment racks with power distribution units, data receptacle plates, cable trays and all other equipment and work indicated on the IT drawings and specified herein.
4. Provide labor, materials, equipment, services, and operations required for the installation of complete and operational telecommunication cable plant as indicated on the drawings and/or specified herein.
5. The work must include all materials and labor required for the installation that complies with all EIA/TIA guidelines, standards, and the current New York City Building Code.
6. Labeled voice-data faceplates, RJ45 jack modules, labeled patch panels, copper patch cables, work station patch cables, grounding bar in IT closet. See Part 2 for additional information.
7. Equipment racks must be provided with all required termination equipment, power distribution units (PDU's), UPS and wire management products.
8. Grounding system must be provided in accordance with ANSI/TIA/EIA-607 for technology equipment in each rack location.
9. Verification of dimensions and conditions at job site prior to equipment installation.
10. Coordination with associated trades.
11. Certification of wire performance.

C. Any additional materials or services needed in order to meet the general requirements stated above, even if not specifically mentioned herein or on the drawings, must be provided by the Contractor without claim for additional payment.

1.3 RELATED SECTIONS

A. General provisions for Electrical work - applicable sections of Division 26.

B. Section 27 10 10 Audio-Visual System Equipment.

C. Section 28 00 00 Security Systems.

1.4 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 "Quality Requirements".

B. Work must be done by persons skilled in this trade in strict accordance with the requirements and/or specifications of the manufacturers of the material being used.

C. Coordinate work with that of all other trades affected by work of this Section. Cooperate with such trades to assure steady progress of all work under Contract.

D. All electrical equipment and materials must have the listing of the Underwriters' Laboratories, Inc., and must bear the labels attesting to UL listing, and types approved for use in New York City.

E. The contractor must be a member of BICSI and employ at minimum, one person who is a registered RCCD who will oversee work of the project. All installation work must be in compliance with BICSI standards.

F. Additional Reference Standards:

1. Published specifications, standards, tests, or recommended methods of trade, industry or governmental organizations apply to work in all sections as notes below:
   a. OSHA - Occupational Safety and Health Administration Regulations.
   b. NEMA - National Electrical Manufacturers Association
   c. UL - Underwriter's Laboratories
   d. NFPA - National Fire Protection Association
   e. ANSI – American National Standards Institute
   f. CCIA – Computer Communications Industry Association
   g. EIA - Electronics Industries Alliance
   h. FCC - Federal Communications Commission
   i. ITU - International Telecommunications Union
   j. NEC - National Electric Code
   k. Building Infrastructure Consulting Service International (BICSI) Telecommunication Methods Manual, 10th Edition and Information Transportation Systems Installation Manual, 4th Edition
   l. TIA – Telecommunications Industry Association
      1) TIA/EIA 526-7 Measurement of Optical Power Loss of Installed Single Mode Fiber Cable Plant Standard 1998
      2) TIA/EIA 526-14A Measurement of Optical Power Loss of Installed Multi Mode Fiber Cable Plant Standard 1998
      3) TIA/EIA 568-B.1 Commercial Building Telecommunications Cabling Standard General Requirements 2001
      4) TIA/EIA TSB67 Transmission Performance Specifications for Field Testing of Unshielded Pair Cabling Systems.
      5) TIA/EIA 606A Administration Standard for Commercial Telecommunication Infrastructure 2002.
      6) J-STD-607-A Commercial Building Grounding and Bonding Requirements for Telecommunication Standard 2002

G. The contractor must be approved by the manufacturer of the major equipment items specified including but not limited to patch panels, cable and all other major components of the specified herein.

H. The contractor must have successfully provided installation and engineering services over completed installations for a period of three years and must have completed similar installations of this type. The Commissioner will be the final judge of suitability of experience.

1.5 JOB CONDITIONS

A. Investigate the nature and location of the Work, the general and local conditions, particularly those bearing upon the Work required such as: transportation, disposal, handling and storage of materials, availability of labor, electric power and physical conditions at the site and character of equipment and facilities needed during the execution of the Work. Obtain all information that can affect the Work, or cost thereof under the Contract.

B. The Contractor must coordinate shop drawings well in advance with other trades. It is the Contractor's sole responsibility to obtain all necessary information from other trades.

1.6 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 013300 "Submittal Procedures".

1.7 SUBMITTALS

A. Shop drawings and samples must be submitted in accordance with the requirements established in the DDC General Conditions or specified elsewhere and must in addition include at minimum the following:

1. Plan, elevation, section as required to fully illustrate all power, telephone, voice, data, fire alarm, outlets, including all system wiring devices such as pull boxes, conduit in slab, stub-up locations, outlet boxes, cable trays indicated on the ITS and Electrical drawings including conduit and cable routing (1/4" = 1'-0" min.)
2. The Contractor must coordinate shop drawings well in advance with other trades. It is the Contractor's sole responsibility to obtain all necessary information from other trades.
3. Plans to include nomenclature for face plate receptacle ID numbers.
4. Detail layout of equipment in IDF closet including rack elevations, plan layout, grounding detail, etc.
5. Provide color coded plans for items described above in paragraph #1.
6. Submit manufacturer's product data sheet on each component to the Information Technology Cable Plant including but not limited to:
   a. Sample and product data of each cable type to be used, patch panel, face plate, RJ45 receptacle, cable and receptacle type used in the system.
   b. Typical back box for mounted in concrete (2 gang with 1 gang extension and cover plate).
   c. Typical back box for mounted in in gypsum wall board, ACT or other substrates.
7. Pull Schedules that will include cable ID, cable length, Patch Panel Termination Frame ID, Port/Position number, Cabinet ID, Riser ID.

B. The following samples must be provided to the Commissioner for review prior to installation:

1. Specified cover plates with jack modules for wall, ceiling and floor box locations. Sample must include proposed jack identification.
2. Cable labels.
3. Cable dressing materials.
4. Wire management hardware such as J-Hooks, cable ties, etc.
5. Patch panel with labeling and cable dressing.
6. Each floor box type with specified cover plate installed.

C. As-Built drawings.

1. During the progress of the work, Contractor must make a careful record of all changes by which the actual installation differs from that indicated on the Bid Documents. Upon completion of work, Contractor must compile a complete set of the design drawings with all changes incorporated electronically. Visibly indicate changes and deviations from scope with "clouds" or similar technique for identifying changes to the drawings.
2. Prior to contract closeout, submit one (2) hard copy of the system record drawings and documents to the Commissioner. The Contractor will be required to make any requested changes to documents before a final approval and acceptance is issued.
3. Upon approval from the Commissioner, submit two (2) hard copies of the "as-built" drawings to the City of New York in accordance with the General Conditions. In addition, provide electronic files of all record drawings in AutoCAD 20022 format and PDF.
4. The "as-built" drawings must include all ladder rack and basket tray routing, cable routing, outlet and cable labeling, telecommunication room layouts and equipment elevations.
5. Cable pull schedules must be updated as necessary and submitted with the drawings.

D. Test Results:

1. Prior to systems acceptance and commissioning, submit system-testing documentation showing methods and results for all tests performed.
2. If certain equipment is determined to be exempt from system testing, the Contractor must state that the equipment was not tested (in written form), and provide specific reasons for the exclusion of test results for said equipment, cabling, or system.
3. Electronic cable tests must be submitted to Commissioner for review in a PDF format. Subsequent field changes may be required to remedy poor test results.
4. The Contractor will submit the test results (30) thirty days prior to Substantial Completion to allow for field changes prior to the expected move-in date.

1.8 DELIVERY, STORAGE AND HANDLING

A. Protect product from damage. Comply with all manufacturers' recommendation for handling, storage and protection.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace manufactured equipment that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

1.10 PUBLICATION

A. Written approval from the Commissioner must be obtained prior to the release of any information concerning this project.

PART 2 - PRODUCTS

2.1 DESCRIPTION OF SYSTEMS

A. Provide all raceways, back boxes, pull boxes, sleeves, and floor boxes indicated in the documents for interconnection among and between the devices comprising the systems indicated in Part 1 above along with specified network hardware.

B. All raceways and related equipment must be provided as per applicable sections of electrical specifications, the Drawings and in accordance with the National Electrical Code and NYC Building Code.

C. See electrical drawings and specifications for additional requirements.

2.2 GENERAL REQUIREMENTS

A. All materials and components must be new and of manufacturer's finest quality as appropriate to the application.

B. Uniform materials and components must be used throughout, and wherever possible, must be field replaceable and commonly available.

C. All materials must conform to applicable UL standards and to general electrical requirements unless specifically accepted by requirements of this section.

D. See applicable sections of Division 26 for more information.

2.3 PRODUCTS

A. General Requirements.

1. All floor boxes must be UL listed for scrub water and all other code requirements. See electrical drawings for floor specification.
2. Conduits must be routed to appropriate side of box accommodating services as described below.
3. Routing of conduits in slab and above finish ceilings must be coordinated with structural requirements.
4. Refer Architectural drawings for information regarding finish ceilings.

B. Electrical Work Embedded In Concrete

1. Provide suitable PVC ENT, (Electrical non-metallic tubing) or rigid conduit, pull boxes for conduit and fitting for conduit paths to be encased in concrete if applicable.
2. Any ENT used must meet the requirements of UL Standard UL 1653 and must be listed by Underwriters Laboratories, Inc., as suitable for its intended purpose.
3. ENT must be recognized by a CABO National Evaluation Report for use in 1-hour and 2-hour rated construction.
4. Penetration of fire rated walls, floors or ceilings must use classified Through-Penetration Firestop Systems described in the current Underwriters Laboratories Fire Resistance Directory.
5. Fittings, accessories and outlet boxes must be designed for use with selected conduit. All components must be listed by Underwriters Laboratories and must be from one manufacturer.
6. Unless indicated differently on drawings, ENT systems must be color coded: BLUE for low voltage power, YELLOW for other low voltage communications, For PVC conduit, conduit must be painted in similar color schedule at each end or at pull box locations.

C. Electrical Work Not Embedded in Concrete

1. Provide suitable EMT, (electrical metallic tubing), pull boxes for conduit and fitting for conduit paths not encased in concrete.
2. Any EMT used must meet the requirements of UL Standards and must be listed by Underwriters Laboratories, Inc., as suitable for its intended purpose.
3. Penetration of fire rated walls, floors or ceilings must use classified Through-Penetration Firestop Systems described in the current Underwriters Laboratories Fire Resistance Directory.
4. Fittings, accessories and outlet boxes must be designed for use with selected conduit. All components must be listed by Underwriters Laboratories and must be from one manufacturer.
5. Receptacle boxes, where located on the drawings for IT raceway system, must be in accordance with NEMA/EEMAC, UL 50 Type 1 and IEC 529, IP30.
6. Boxes must be fabricated from 16 gauge or 14 gauge steel. All boxes must be provided with cover plates for flush mounting except where otherwise noted. Knockouts for conduits must be as required to meet conduit sizes indicated on plans.
9. Wireless access boxes must be mounted to the underside of the slab above the ceiling where the ceiling is accessible. If wireless access point boxes are called for mounting in non-accessible ceiling, provide 1 gang, 3” deep flush junction box and appropriate faceplate.
11. Typical device backbox must be (2) gang, 2-1/8" deep with (1) gang reducer to accept one gang finish plate.
12. Provide knock-out for 1-1/4" EMT conduit stub-up to nearest cable tray or accessible ceiling where provided. If there is no accessible ceiling, extend conduit to termination rack in IT room or to pull box in storage rooms, janitors closet, toilet rooms, etc.
13. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Midland Ross
    b. Leviton, Steel City,
    c. Hubbell,
    d. Or approved equal.

D. Conduit Sleeves

1. Conduit sleeves where required must be installed in accordance with applicable sections of the electrical specifications and as described herein.
2. Conduit sleeves must be provided with insulated bushings at each end.
3. Sleeves without exception must be treated to create an airtight condition. Where sleeves pass through a fire rated partition or floor, firestop all penetrations to be code compliant.
4. Exact size of conduit sleeves will be as required to have a maximum of 40% cable fill. Verify exact location of all sleeves with the Architectural drawings.

2.4 STRUCTURED CABLING CABLE

A. 4-Pair Category 6A UTP Cable

1. Cable must be 100-Ohm, 4-pair unshielded twisted pair cable with 24 AWG solid copper conductors.
2. Cable must be plenum rated.
3. Cable must meet or exceed all performance characteristics specified in the ANSI/TIA/EIA-568-B-2.1 Draft 10 standard for Category 6A cable.
4. Must support 1000BASE-T, 1000BASE-TX, and all current applications designed to be supported by Category 6A.
5. Cable jacket color must be:
   a. Data Services - Blue Service
   c. Wireless Access Points – White
6. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Belden
   b. Siemon
   c. Ortronics
   a. Or approved equal.

B. Copper Patch Cords

1. Cords must consist of 4-pairs of 24 AWG stranded copper conductors.
2. 8-positition modular plugs (RJ-45 type), wired straight through, with flex hoods on each end.
3. 100% transmission tested with laboratory grade network analyzers for proper performance up to 300 MHz. Vendor must guarantee cords are compatible with Category 6A channels.
4. UL verified (or equivalent) for TIA/EIA Category 6A electrical performance.
5. Provide a quantity of patch cords as needed to patch the work area and IDF room terminations.
6. Patch cords must be ordered in lengths that will leave no more than 18 inches of slack in any single patch, based on telecommunication room equipment layout.
7. Provide labor and materials to perform copper patch cord connections to City of New York furnished network electronics for each IT cable.
8. Patch cable must be Category 6A or approved equal.

2.5 STRUCTURED CABLING TERMINATION HARDWARE

A. 48-Port Category 6A UTP Patch Panel

1. Patch panels must be used for terminations of horizontal voice, data and wireless access point cables in IT racks where called for on the drawings.
2. Provide sufficient quantities to terminate each voice, data and wireless access point cable indicated on drawings.
3. Provide separate patch panel for Wireless Access point cabling, wiring to video projectors and AV racks.
3. Patch panel must be modular to 110-type patch panels, complete with Category 6A T568B RJ45 jacks.
4. Patch panel must be high density, 19-inch rack mountable and two (2) rack units high.
5. Provide one (2) rack unit cable management panel for each patch panel provided.
6. Manufacturers: Subject to compliance with requirements, provide patch panels by one of the following:

    a. Ortronics
    b. Panduit
    c. Siemon
    d. Or approved equal.

B. Horizontal Cable Management Panels

1. Panels must be used to organize patch cables in equipment racks.
2. Panels must be 19-inch rack mountable, two (2) rack units high with 3.5-inch deep cable management rings.
3. Panels must be full steel construction.
4. Manufacturers: Subject to compliance with requirements, provide panels by one of the following:

    a. Ortronics
    b. Panduit
    c. CPI
    d. Or approved equal.

2.6 STRUCTURED CABLING WORK AREA TERMINATION HARDWARE

A. Data outlet faceplates

1. Faceplates must be installed at all wall mounted outlet locations to accommodate termination modules and connectors for horizontal cabling.
2. See drawings for quantities, locations and configurations.
3. Single gang faceplate.
4. Outlet faceplate must be custom bead blasted stainless steel with (4) four ports for RJ45 receptacles. Provide blanks for ports not used.
5. IT plates can be standard white.
6. All visible voice-data locations, unless noted otherwise, must be provided with the exact same faceplate.

B. Category 6A RJ45 Jacks

1. Must be used for termination of horizontal voice cabling at work area outlet.
2. EIA/TIA 568B termination.
3. Color: White

C. Faceplate Labels

1. Must be used to label all outlets.
2. Color: White
3. Faceplate numbering method must use Room Number, Device No. in room, D1, D2 etc or V1.
4. Submit sample for review
5. Basis-of-Design Product: subject compliance with requirements, provide labels generated on Brother P-Touch or comparable product by one of the following:

   a. Dymo
   b. Adobe
   c. Or approved equal.

2.7 STRUCTURED CABLING SUPPORT EQUIPMENT. NETWORK AND VOICE HARDWARE

A. Cable Termination Equipment Rack for the IT closet

1. Rack must be used for mounting of patch panels, wire management and network switches.
2. Rack must be 45 rack units, 19-inch mountable with standard EIA hole spacing.
3. Racks must be bolted to slab at front and rear flanges and tied to overhead ladder rack for additional stability with treaded rod and steel channels from Unistrut or Kindorf.
4. Racks must be grounded by a #6 AWG wire with green insulation to copper bus bar.
5. Racks must be provided with equipment mounting screws (50 per rack minimum).
6. Each rack must be provided with double sided vertical cable management unit from APC.
7. Racks must be provided with (1) six-foot long power distribution units with L5-20R receptacle to connect to a UPS.
8. Cable Termination Rack:
   a. Sole Source Product: AR3810 by APC.
   b. No substitutions will be permitted.

B. IT Rack Power

1. Quantity of (1) one rack mounted UPS:
   a. Sole Source Product: APC # SMX1500RM2UNC or current model, with rack mount kit.
   b. No substitutions permitted.

2. (1) Vertical power distribution unit must be a minimum 6’ total and must have Edison receptacles.

2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. APC
   b. Tripp Lite
   c. Eaton
   d. Or approved equal.

C. Cable Tray

1. In IT closet, provide cable tray and all required fittings, transition members, junction and butt splice kits, radius bend members, protective end caps, end closing hardware, support brackets and attachment hardware for cable tray where indicated on the drawings.
2. Cable tray must be UL listed and fabricated from wire mesh must be nominally 2" high by 18" wide or per width called out on the drawings.
3. Cable tray must be grounded to copper bus bar.
4. Basis of Design product: Subject to compliance with requirements, provide products by Cablofil CF54 or comparable product by one of the following:
   a. Wiremold
   b. Snaketray
   c. Or approved equal.

D. Cable Management Straps

1. Cable straps must be installed to support horizontal cabling in accessible ceilings.
2. Spacing between straps must not exceed five (5) feet.
3. Cables must be neatly bundled and tied at each strap and at the midpoint of each span between straps.
4. Basis-of-Design Product: subject compliance with requirements, provide Safe-T-Grip cable support straps by Chatsworth or comparable product by one of the following:
   a. Velcro
   b. Hook and Loop
   c. Or approved equal.

E. Network Switches

1. Furnished by City of New York - Installed by City of New York

F. Wireless Access Points

1. Furnished by City of New York - Installed by City of New York

G. VoIP Phones - Quantity of 10.

1. Furnished by City of New York - Installed by City of New York. Provide 8' long patch cable for each phone.

H. People Counter

1. Quantity of (1) one ceiling mounted People Counter:

2. Sole Source Product: Traf-Sys: Eclipse People Counter, overhead video-based people counter and associated VisiCount software.

   a. No Substitutions Permitted.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL REQUIREMENTS

A. Conduit must be provided between devices except in areas with accessible ceiling areas. Coordinate with other trades in providing vertical conduit risers.

B. All conduit must be concealed except in areas with no finish ceiling.

C. Contract Drawings are diagrammatic and indicate general arrangement of systems and work included. Verify exact location of all electrical devices with architectural drawings. If a dimension is not indicated on either the architectural or IT drawings, request in writing, required information prior to proceeding. Any work installed without written direction that is not specifically indicated on the drawings may be rejected and relocated at the Contractor's expense. All finishes or work of other trades damaged by relocation of any electrical device will be the responsibility of the Contractor.

D. Final location of all equipment must be located as shown on Contractor's reviewed Shop Drawings, or as located in the field by the Commissioner, or as shown on supplementary drawings. Check drawings of other trades relating to work to verify spaces in which work will be installed. In centering outlets and locating boxes allow for overhead pipes, ducts and mechanical equipment, variations in fireproofing and plastering, window and door trim, paneling, hung ceilings, and the like, and correct any inaccuracy resulting from failure to do so without expense.

3.3 RACEWAYS

A. General Requirements

1. No exposed raceways will be permitted.
2. Pull no wire, insert no fish wire, until raceway and outlet boxes are permanently in place.
3. Provide cable supports for wire in riser conduits as required by code, if applicable.
4. Provide pull boxes in horizontal conduit running every 100 feet as indicated or wherever necessary to facilitate pulling in of wire. Coordinate locations with other trades to provide access.
5. PVC or flexible conduit will not be permitted unless approved in advance.
6. All conduit penetrations through acoustically rated partitions must be a maximum of 1/2" larger than the penetrating conduit and must be thoroughly caulked with acoustical non-

setting caulk.

7. Provide drag lines with conduit destination noted on drag line to facilitate pulling of cable.
8. After cable pulling is complete, treat conduits with firestop as specified in Division 26 as required for code compliance.

B. Raceway Grounding & Isolation

1. Signal conduits must be mechanically and electrically connected to receptacle boxes and must be electrically isolated from system equipment racks. Connect all signal conduits with heavy insulated ground wire to the ground of the nearest ground of a utility panel.
2. Provide terminals of conduits with lock nut and insulated bushing for connection to pull boxes servicing more than one conduit subsystem as described in the separation Guide Identification table in Article 3.4.

3.4 STRUCTURED CABLE PLANT INSTALLATION

A. Cable Installation:

1. General:

a. All cables, regardless of length, must be marked with wrap-around typed number or letter cable markers at both ends. There must not be any unmarked cable at any location. Cable numbers must correspond to the workstation termination label.
b. No cable must be installed with a bend radius less than that recommended by the cable manufacturer. As a guideline, the typical minimum bend radius for copper cable is four (4) times the outside diameter of the cable. The typical minimum bend radius for fiber optic cable is ten (10) times the outside diameter of the cable.
c. The maximum cable pulling tensions must not exceed manufacturer's specifications.
d. Cables must not contain splices, unless specifically required for performance of the system.
e. All cable terminations involving RJ45, and other connectors, must be firmly terminated in compliance with BISCI standards. "Screw-on" connectors and other similar connector types will not be approved.

2. The following table shall be used as a guide for the minimum separation required between signal conduits.

a. Group Identification
   1) Microphone conduit (0mV-100mV)
   2) Line level conduit (100mV-10V)
   3) Loudspeaker conduit (10V-70.7V)
   4) Telephone, Video and digital communication conduit

Group	a	b	c	d
a	-	6"	12"	12"
b	6"	-	12"	6"
c	12"	12"	-	6"
d	12"	6"	6"	-

b. Group Identification
   1) Dimmer controlled lighting circuits
   2) Power circuits (120V and above)
   3) Plumbing Pipe
   4) Heat Sources

Group	e	f	g	h
A	24"	12"	6"	12"
B	24"	12"	6”	12”
C	12	12"	6”	6"
D	12"	12"	6"	6”

3. Cable Pathways:

   a. Grounding and bonding of pathways must comply with EIA/TIA 607 grounding standards and New York City codes and regulations.
   b. Pathways must not have exposed sharp edges that may encounter telecommunications cables.
   c. The number of cables placed in a pathway must not exceed manufacturer specifications or distort the geometric shape of any cables within.
   d. Maximum pathway capacity must not exceed a 40% fill.
   e. Pathways must not be located in elevator shafts.
   f. All horizontal cables, regardless of media type, must not exceed 90-meters (295 ft) from the telecommunications outlets in the work area to the horizontal cross connect location. No cable run must be terminated and tested at a length beyond 90-meters.
   g. Telecommunications pathways, spaces, and metallic cables, which run parallel with electric power or lighting that is less than or equal to 480 Vrms, must be installed with a minimum clearance of 12 inches.

4. Cable Supports:

   a. All cable supports in an open ceiling must be structurally independent of the

suspended ceiling, its framework, and supports. Cable supports must be spaced no more than 5-feet apart.

b. Cables routed in a suspended ceiling must not be draped across the ceiling tiles. Cable supports must be mounted a minimum of 3-inches above the ceiling grid supporting the tiles.

c. Contractor must observe the manufacturer's recommended bending radius and pulling strength requirements of all cables during handling and installation.

d. In the IT room or chases where cable ladder racks are used, Contractor must provide Velcro cable ties to create a neat appearance.

5. Cable Slack:

a. A minimum of 12 inches of cable should be coiled up in the electrical back box so the faceplate and jacks can be serviced, if necessary. Additionally, a minimum of 3 feet of cable slack must be coiled above the ceiling (or below the raised floor) to re-position the outlet, if necessary.

b. In the IT room a minimum of six (6) feet of slack should be left for all cable types. This slack must be neatly managed on trays or other support types above the ceiling.

c. Provide ample cable slack to allow for servicing equipment racks that are located against a wall or other permanent interfering surface. Create an umbilical cord, or similar method of containing the cables.

6. Cable Tie-Wraps:

a. Velcro tie-wraps must be used at appropriate intervals to secure cable and to provide strain relief at termination points. These wraps must not be over-tightened to the point of deforming or crimping the cable sheath.

b. Hook and loop cable managers should be used in the telecommunications rooms where reconfiguration of cables and terminations may be frequent.

7. Fire protection:

a. Properly installed firestop systems must be implemented to prevent or retard the spread of fire, smoke, water, and gases through the building. This requirement applies to openings designed for telecommunications or low-voltage cable use that may or may not be penetrated by cables, wires, or raceways.

b. Fire stops must be installed according to New York City building code requirements and NFPA.

C. Equipment Installation:

1. Installation must include the delivery, unloading, setting in place, fastening to walls, floors, ceilings, counters, or other structures where required, interconnecting wiring of the system components, equipment alignment and adjustments, and all other work whether or not expressly required herein which is necessary to result in complete operational systems.

2. Fastenings and supports must be adequate to support their weight loads with a safety factor of at least five (5).

3. In the installation of equipment and cable, consideration must be given not only to operational efficiency, but also to overall aesthetic factors.

4. All equipment must be firmly secured in place unless requirements of portability dictate otherwise.
5. All blocks, equipment, etc., must be secured plumb and square.

D. Grounding Procedures:

1. The following grounding procedures must be followed:

   a. A single primary "system ground" must be established for the system in the IT closet.
   b. All grounding conductors in that area must connect to this primary system ground. The system ground must be provided in the equipment rack for the area. It must consist of a copper bar of sufficient size to accommodate all secondary ground conductors.
   b. A copper conductor (No. 6 AWG solid conductor wire, with green insulation, having a maximum of 0.1-Ohms total resistance) must connect the primary system ground bar. The Contractor will be responsible for determining if the metallic conduit is electrically bonded properly to the building ground system.
   c. Secondary system grounding conductors (No. 6 AWG solid conductor wire, with green insulation, with lug attached to rack/cabinet and corresponding ground bar) must be provided from all racks, cabinets, consoles, cable trays, ladder racks, related conduit, and ungrounded equipment in each area, to the primary system grounding point for the area. Each of these grounding conductors must have a maximum of 0.1-Ohms total resistance.
   d. It is acceptable practice to extend a single conductor to adjacent equipment racks in a row, providing one lug at each rack. However, no ground conductor splices at any point between the grounding point and the lug installed at the rack farthest from the grounding point will be permitted.
   e. Under no conditions will the AC neutral conductor be used for a system ground, either in the power panel or in a receptacle outlet.
   f. Because of the great number of possible variations in grounding systems, it will be the responsibility of the Contractor to follow good engineering practice, as outlined above, and to deviate from these practices only when necessary to minimize crosstalk and to maximize signal-to-noise ratios in the system.
   g. All grounding and bonding must comply with EIA/TIA 607 grounding standards and New York City Electrical Code.

3.5 QUALITY CONTROL AND COPPER CABLE TESTING

A. Quality Control

1. Contractor to procure only new cable and equipment for this project.
2. Contractor to ensure that all equipment and cable are free of defects and are protected under respective manufacturer warranties.

B. Copper Cable Testing:

1. All pre-fabricated cables must be factory tested for continuity before shipment. Contractor must submit documentation to prove the cables have been tested by the manufacturer to industry standards.
2. Contractor must provide a thorough testing program for the communications cabling

plant including final acceptance testing. Contractor must provide procedures, a list of test equipment and operating instructions before the tests.

3. Subsystems must be tested individually before testing for end-to-end connectivity. All faults must be corrected and retested. All test results must be completely documented by Contractor.
4. For all cable that fails manufacturer's or specified testing criteria, the contractor must correct the problem or replace the cable or defective component at no additional expense to the City of New York.
5. Contractor must provide two (2) hard copies and one (1) electronic copy (Microsoft Excel or PDF format) of a summary of results for all cables and equipment tested, including: cable ID, strand ID (for fiber optic cables), cable length, and pass/fail result.
6. All test results must be submitted in a sequential, organized fashion, as per the Specification and/or project schedule.

C. Test Process:

1. The Commissioner reserves the right to be present during any or all of testing.
2. Testing must be of the Permanent Link. However, Contractor must guarantee performance (see Part 3) based on Channel performance and provide patch cords that meet channel performance.
3. All cabling not tested strictly in accordance with these procedures must be re-tested at no additional cost to the City of New York.
4. 100% of the installed cabling must be tested. All tests must pass acceptance criteria defined in Part 2, section 3.
5. Test equipment must be fully charged prior to each days testing.
6. Standards Compliance & Test Requirements
   a. Copper cabling must meet TIA 568B Category 6
   b. All test equipment used must meet the performance specifications defined in paragraph 9 below.

7. Documentation

   a. Test reports must be submitted in electronic format. Hand-written test reports are not acceptable.
   b. An attached affidavit verifying passing execution of all tests. For large installations electronic reports are preferred. Summary reports must contain the following information on each row of the report: circuit ID, test specification used, length, date of test, and pass/fail result.
   c. Reports must be accompanied by a Certificate signed by an authorized representative of the Contractor warranting the truth and accuracy of the electronic report. Certificate must reference traceable circuit numbers that match the electronic record.
   d. Test reports must include the following information for each cabling element tested.
      1) Wiremap results that indicate the cabling has no shorts, opens, miswires, split, reversed, or crossed pairs, and end to end connectivity is achieved.

      2) For Category 6 cabling tests results must include the following test results:

         a) Attenuation, Near End Cross Talk (NEXT)
         b) Power Sum Alien Next (PSANEXT)

c) Power Sum Near End Crosstalk (PSNEXT)
d) Insertion Loss (IL)
e) Return Loss (RL)
f) Attenuation to Cross Talk Ratio -Far End (ACRN)
g) Power Sum Attenuation to Cross Talk Ratio - Near End (PSACR-N)
h) Power Sum Alien Attenuation to Crosstalk Ratio - From Far End (PSAACRF)
i) Far End Crosstalk (FEXT).
j) Power Sum Attenuation to Crosstalk Ratio - Far End (PSACRF)
k) Length
l) Propagation Delay
m) Delay Skew

3) Data that indicates the worst-case result, the frequency at which it occurs, the limit at that point, and the margin. These tests must be performed in a swept frequency manner from 1 MHz to highest relevant frequency, using a swept frequency interval that is consistent with TIA and ISO requirements. Information must be provided for all pairs or pair combinations and in both directions when required by the appropriate standards. Any individual test that fails the relevant performance specification must be marked as a FAIL.

4) Length (in meters), propagation delay, and delay skew relative to the relevant limit. Any individual test that fails the relevant performance specification must be marked as a FAIL.

5) Cable manufacturer, cable model number/type, and NVP.

6) Tester manufacturer, model, serial number, hardware version, and software version.

7) Circuit ID number, date and project name.

8) Autotest specification used.

9) Overall pass/fail indication.

8. Test reports must be submitted within 7 business days of completion of testing and at least (30) days prior to substantial completion.
9. Test Equipment
   a. Test equipment used under this contract must be from manufacturers that have a minimum of 5 years experience in producing field test equipment. Manufacturers must be ISO 9001 certified.
   b. All test tools of a given type must be from the same manufacturer, and have compatible electronic results output.
   c. Test adapter cables must be approved by the manufacturer of the test equipment. Adapters from other sources are not acceptable.
   d. Baseline accuracy of the test equipment must exceed TIA Level III, as indicated by independent laboratory testing.

e. Test equipment must be capable of certifying Category 6 links.
f. Test equipment must have a dynamic range of at least 100 dB to minimize measurement uncertainty.
g. Test equipment must be capable of storing full frequency sweep data for all tests and printing color graphical reports for all swept measurements.
h. Test equipment must include S-Band time domain diagnostics for NEXT and return loss (TDNXT and TDRL) for accurate and efficient troubleshooting.
i. Test equipment must be capable of running individual NEXT, return loss, etc measurements in addition to autotests. Individual tests increase productivity when diagnosing faults.
j. Test equipment must include a library of cable types, sorted by major manufacturer.
k. Test equipment must store at least 1000 Category 6 autotests in internal memory.
l. Test equipment must be able to internally group autotests and cables in project folders for good records management.
m. Test equipment must include DSP technology for support of advanced measurements.
n. Test equipment must make swept frequency measurements in compliance with TIA standards.
o. The measurement reference plane of the test equipment will start immediately at the output of the test equipment interface connector. There must not be a time domain dead zone of any distance that excludes any part of the link from the measurement.

3.6 PRE-INSTALLATION INSPECTION

A. Visually inspect all cables, cable reels, and shipping cartons to detect possible cable damage incurred during shipping and transport. Visibly damaged goods are to be returned to the supplier and replaced at no additional cost.

B. If post-manufacture performance data has been supplied by the manufacturer of cables or connecting hardware, copies of such data are to be kept for inclusion in the Documentation and made available to the Commissioner upon request.

C. All materials are to be new and unused.

3.7 FINAL ACCEPTANCE

A. Acceptance

1. Once all work has been completed, test documentation has been submitted, and the Commissioner is satisfied that all work is in accordance with contract documents, Contractor will be notified in writing of formal acceptance of the system.

2. Acceptance Requirements

a. Contractor must warrant in writing that 100% of the installation meets the requirements specified under Part 2 above.

3.8 WORKMANSHIP

A. The installation of all work must be neat. All boxes, equipment, etc., must be plumb and square.

B. The Contractor must keep the job adequately staffed at all times. Unless illness, loss of personnel, or other circumstances beyond the control of Contractor intervene, they must keep the same individual in charge throughout its execution.

C. Following installation, all soiled, abraded or discolored surfaces of work installed herein will be cleaned and left free from blemishes or defects.

D. Work that is damaged or improperly installed will be removed and replaced and the entire installation left in complete satisfactory condition.

E. Clean the areas affected by the Work to a level of operational cleanliness and vacuum clean.

F. The Contractor must remove from the job site all rubbish and refuse at the end of each day and must keep the work area clean.

G. Any damage brought about by Contractor's work must be restored by the Contractor at no cost to the City of New York.

H. It will be the responsibility of the Contractor to cooperate with other trades in order to achieve well-coordinated progress and satisfactory final results. They must watch for conflicts with work of other trades on the job and execute, without claim for extra payment, moderate moves or changes as are necessary to accommodate other equipment or preserve symmetry and pleasing appearance.

END OF SECTION 27 10 00

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 27 41 00 - AUDIO-VIDEO SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Audio-Visual systems include loudspeakers, video monitors, assistive listening systems, AV racks, faceplates etc. as located on the contract drawings. All final locations to be confirmed by the Commissioner prior to installation.

B. Provide installation of all systems, equipment and assemblies specified herein. Types of work in this section include (but are not necessarily limited to):

1. Audio-Visual systems including, multi-zone paging electronics, loudspeakers, video monitors, wireless microphones, loop type assistive listening systems with receivers, laptop input, loudspeakers, amplifiers, electronics.

2. Custom faceplates and equipment rack.

3. Portable and loose equipment.

4. Verification of dimensions and conditions at the job site.

5. Submission of shop drawings for review prior to fabrication.

6. Fabrication and assembly in accordance with these specifications, equipment manufacturer's recommendations and New York City Building code requirements.

7. Installation of system equipment.

8. Inspection, alignment and final adjustment of completed installation, demonstration for acceptance and instruction of operating personnel.

9. Pulling of AV cables.

10. Coordination with other trades of adjoining and related work.

11. Instruction.

1.3 RELATED WORK

A. Refer to Division 26.

1.4 INDUSTRY STANDARDS

A. Regulatory Agencies: Work must be carried out in conformance the standards of the National Systems Contractors Association (NSCA), New York City Building and Electrical Codes, the requirements of OSHA, provisions of Underwriter's Laboratories, Electronic Industries Association and National Fire Protection Association.

B. Installation will be provided in accordance with New York City building and electrical codes.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. The system must be comprised of components that are of professional quality.

C. The provision of equipment and services as described herein must be provided by a qualified Audio Visual Subcontractor.

D. The Audio Visual Subcontractor must be an approved by the manufacturer of the major equipment items specified including but not limited to loudspeakers, mixing console, amplifiers, video projectors, video switchers and audio visual devices specified herein.

1.6 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.7 SUBMITTALS

A. Shop Drawings and Samples:
1. The following information and scaled drawings must be provided for review prior to fabrication:

a. Provide a PDF submission with a complete written list of all components, quantities, and model numbers to be provided by AV Subcontractor accompanied by manufacturer's cut sheets that indicate major dimensions, specifications and finishes of all equipment and accessories.

b. Wiring and interconnection diagrams of system components including notation of type and manufacturer of all items including equipment make and model number, cable types and numbers, connector types (scale as required).

c. CAD drawings of equipment rack layouts in plan and elevation.

d. Signal routing layouts with legend and wiring details (scale as required).

e. Point to point riser diagram(s) or cable pull sheet indicating cable types and quantities. Riser diagram or pull sheet to include cable identification numbering

scheme that matches functional diagram.

f. Receptacle plate details showing engraved or silk screened legends, connector type and finish (scale as required).

2. All shop drawings must be CAD generated. Drawings submitted for review must be on the same sheet size, unless specifically approved otherwise. Each drawing must have a 3” x 5” space reserved in the lower right corner for the Commissioner’s review stamp. Drawings used in the fabrication and installation of the systems specified herein must bear the Commissioner’s stamp.

3. Thumb drives with as-built drawing files and remote control source code must be included in the final system documentation material turned over to the City of New York.

4. Review of shop drawings will not be considered as a guarantee of measurements of building conditions. Where drawings are indicated as having been reviewed, said review does not mean that drawings have been checked in detail, and said review does not in any way relieve the Contractor from their responsibility or necessity of furnishing material or performing work as required by the Contract Specifications.

C. The Contractor must submit the following samples for review prior to construction of the system. Samples are returnable at the Contractor's request, following review. All Shipping costs must be prepaid.

1. Provide a sample faceplate showing details of finishing, engraving and receptacle mounting. This plate must contain one of each type of connector used on the project.

D. Manuals:

1. Within thirty days of Final Acceptance tests, the Contractor must furnish the following:

a. Four thumb drives with pdf format of as built block diagrams of the system giving the essentials of the installation and their functional relations.

b. One thumb drive, pdf format of complete instruction, operation and maintenance book, including all block and schematic diagrams, wiring diagrams, sizes, and manufacturer’s technical descriptions of components.

c. Provide page with written narrative to enable non-technical staff to perform basic operation of system and video playback of computer and video sources.

1.8 DELIVERY, STORAGE AND HANDLING

A. The equipment to be furnished hereunder must be delivered to the building upon receipt of written notice from the Commissioner that secure storage facilities are available for the Contractor. Delivering hereunder must include unloading the vehicle, transportation to final destination within the building.

B. Fabricated and assembled equipment must be wrapped and sealed in polyethylene and substantially boxed for shipment. Standard components must be shipped in manufacturer's original packing. Boxes must clearly indicate equipment contained, "front", "top", "fragile", nature of components and site location.

1.9 WARRANTY

A. Manufacturer's Warranty for Audi-Visual products Products: Manufacturer must warrant systems and equipment to be free of defective components, faulty workmanship or improper adjustment for warranty period.

1. Warranty Period: 1 year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Sound System:

1. Certain overall performance requirements of the sound system must be checked by measurement. Each system as designed meets the following requirements based upon available data and the manufacturer's published specifications. The Contractor will be responsible for use of the equipment specified in the manner specified, and each component's conformance with its manufacturer's specifications.

2. Residual noise and hum must be below the masking noise levels produced by the air conditioning system, for an overall signal-to-noise ratio of 68 dB for the entire system.

2.2 SYSTEM EQUIPMENT

A. Microphone System and Accessories:

1. Outputs of all microphones must be 150-250 ohms, balanced with respect to ground. The term "sensitivity" as used herein for microphones and expressed in dBm (dB referenced to .001 W) is the microphones available electrical input power level, when driven by a sound pressure of 10 dynes/cm2.

B. Equipment Rack:

1. AV rack must be provided with side and top panels.

2. Unused panel space must be filled with blank solid panels or ventilating panels. Provide all accessories indicated on the drawings.

3. All racks must have black baked enamel finish.

4. All rack mounted equipment must utilize security screws.

5. All rack mounted equipment must be labeled.

C. Loudspeakers and Associated Equipment:

1. All loudspeakers must be phased together. See drawings for cable schedule.

D. Receptacle Plates

1. Custom receptacle plates and back boxes must be provided as needed for the connectivity indicated on the drawings.

2. Finish for wall mounted receptacle plates must be 1/8" thick white anodized aluminum with engraved black lettering.

3. Plate dimensions for surface mounted conditions must be equal to the back box size.

E. Audio Visual Cable

1. Cable indicated on the drawings for interconnection between system equipment and connection to network receptacles will be provided in conduit or surface mounted raceways. No free air cable will be permitted.

2. Contractor must verify appropriateness of system cable and quantity indicated on the ITS drawings prior to installation.

3. All portable cable, connectors for cable provided by other trades and required adapters that connect fixed receptacle panels to loose or fixed equipment will be provided.

4. Provide permanent cable identification tags for all cable used in the system. Cable numbers must be noted in as-built shop drawings.

F. Assistive Listening System

1. Provide a loop type assistive listening system where call for on the drawings in conformance with NYC Local Law 51.

2. Provide head end electrics to accept a line level input from a wireless microphone and from any program audio sources.

3. Coordinate the installation of the loop wire with finish floor and related trades.

2.3 AV EQUIPMENT

A. Multi-Purpose Room

1. Type A Video Monitor and Mount.

a. 98” diagonal 4K resolution.

b. 16:9 aspect ratio.

c. Commercial display suitable for 24/7 operation.

d. 350 cd/m² brightness combined with UHD resolution and new anti-reflective screen surface for clear visibility in higher ambient light conditions.

e. Integrated Media Player allows for audio, video or image playback via USB or SD card.

f. Industrial-strength, premium-grade panel with additional thermal protection, internal temperature sensors with self-diagnostics and fan-based technology, allows for 24/7 operation.

g. Left/right audio out.

h. Wall mount suitable for mounting the monitor to the wall with hinge feature to allow access to the back of the monitor.

i. Product: subject to compliance with requirements, provide one of the following:

1) NEC: C981Q
2) LG : 98UM5J-B
3) Panasonic: TH-98SQE1W
4) Or Approved Equal.

2. HDMI Plate

a. 1 gang faceplate with white finish.

b. HDMI connector provided with HDMI out connector.

c. Extend HDMI cable in conduit to monitor.

d. Manufacturers: subject to compliance with requirements, provide products by one of the following:

1) Arlington Products.
2) RCI Display Devices.
3) Whirlwind
4) Or Approved Equal.

3. Loudspeakers left and right side of monitor

a. 1 gang faceplate with white finish with grommet hole to feed speaker cable from video monitor.

b. Loudspeaker must be provided with wall mount.

c. Loudspeaker must have a white finish.

d. Loudspeaker must be capable of operating at 8 ohm.

e. Product: subject to compliance with requirements, provide one of the following:

1) Control 25-1L by JBL.
2) AD-SC6T by QCS.
3) EVID-S5.2 by Electro-Voice.
4) Or Approved Equal.

4. Wireless Microphone.

a. One channel wireless mic receiver to be located in the AV rack.

b. Wireless mic transmitter to be a handheld mic/transmitter.

c. 24-bit / 48 kHz digital audio quality, efficient and intelligent RF performance, and AES 256-bit encryption.

d. Provide with battery charger and (2) rechargeable batteries.

e. Product: subject to compliance with requirements, provide one of the following:

1) ULXD4 receiver with ULXD2/B58 Mic by Shure.
2) EM 100 G4-A receiver with KM 100 G4 handheld transmitter by Sennheiser.
3) AKG WMS470 System.
4) Or Approved Equal.

5. AV Rack

a. 18 RU steel cabinet with side panels and top.

b. Rack mounted 120V power strip with (6) Edison connectors on rear.

c. UL Listed.

d. Basis-of-Design Product: subject compliance with requirements, provide MMR-1820 by Middle Atlantic or comparable product by one of the following:

1) Lowell Manufacturing.
2) Atlas Sound.
3) Or Approved Equal.

5. Assistive Listening Loop.

   a. Assistive listening system approved for use in NYC for amplification of wireless mic and audio associated with the video monitor interfacing with hearing aids provided with a T-coil.

   b. Coordinate the installation loop system manufacturer wire under finish floor.

   c. UL Listed.

   d. Manufacturers: subject to compliance with requirements, provide products by one of the following:

      1) Williams Sound.
      2) Ovel Window Audio.
      3) Listen Technologies.
      4) Or Approved Equal.

B. Paging Systems

1. The paging system will be a multi-zone system that has the following zones:

   a. Basement Level

   b. First Floor

   c. Mezzanine Floor

2. The paging system must have a telephone, password protected, interface to enable pages to be made from any telephone.

3. The Paging System must be capable of providing up to 4 individual zones.

4. A VoIP telephone handset for paging will be provided.

5. All materials must conform to applicable UL standards and to electrical requirements specified elsewhere unless specifically accepted by requirements of this section.

6. System electronics must be rack mounted and located at the MDF Closet.

7. Speaker cable must be plenum rated 16/2 and installed in accordance with code requirements. Terminate to loudspeaker in accordance with loudspeaker's requirements.

8. Cables must be tagged in a logical manner. And pulled without interruption from device to device without splices.

9. Paging loudspeakers

a. Ceiling loudspeaker must mount recessed in the finish ceiling, must have 6.5” woofer and provided with a 70.7V transformer.

b. Type S1 speakers must be surface mounted with a yoke, with white finish and provided with a 70.7V transformer.

c. Type S2 speaker must be an in-wall type, 6.5 in polymer-coated aluminum-cone woofer with pure butyl rubber surround and 1 in titanium dome low diffraction swivel aimable titanium tweeter, with white grill and 70.7V transformer.

d. Manufacturers: subject to compliance with requirements, provide products by one of the following:

1) JBL
2) QSC
3) Tannoy
4) Or Approved Equal.

10. Paging Electronics

a. Sole Source Product: PCM2000 by Bogen

b. No substitutions will be permitted.

11. Paging Amplifier

a. Amplifier must be 4 channels with a minimum of 200 watts per channel.

b. Amplifier must output at 70.7V to connect to each speaker zone.

c. Manufacturers: subject to compliance with requirements, provide products by one of the following:

1) Electrovoice
2) QSC
3) Ashley
4) Or Approved Equal.

C. YALP Classroom

1. Type B Video Monitor and Mount.

a. 86” diagonal 4K resolution.

b. 16:9 aspect ratio.

c. Commercial display suitable for 24/7 operation.

d. 350 cd/m² brightness combined with UHD resolution and new anti-reflective screen surface for clear visibility in higher ambient light conditions.

e. Integrated Media Player allows for audio, video or image playback via USB or SD card.

f. Industrial-strength, premium-grade panel with additional thermal protection, internal temperature sensors with self-diagnostics and fan-based technology, allows for 24/7 operation.

g. Left/right audio out.

h. Wall mount suitable for mounting the monitor to the wall with hinge feature to allow access to the back of the monitor.

i. Basis-of-Design Product: subject compliance with requirements, provide C861Q by NEC or comparable product by one of the following:

1) LG.
2) Panasonic.
3) Or Approved Equal.

2. HDMI Plate

a. 1 gang faceplate with white finish.

b. HDMI connector provided with HDMI out connector.

c. Extend HDMI cable in conduit to monitor.

d. Manufacturers: subject to compliance with requirements, provide products by one of the following:

1) Arlington Products.
2) RCI.
3) Whirlwind.
4) Or Approved Equal.

PART 3 – EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSPECTION

A. Examine all work prepared by other trades to receive work of this Section and report any defects affecting installation to the Commissioner for correction. Commencement of work

will be construed as complete acceptance of preparatory work by other trades.

3.3 INSTALLATION - GENERAL

A. The Contractor must supply all racks, cable, equipment, etc., required for the installation and needed to provide complete and operational systems. Only to the extent that such ancillary equipment is specified elsewhere is it excluded from system Specifications.

B. All equipment except portable equipment must be held firmly in place. This must include video projectors, loudspeakers, cables, control equipment, rack equipment, etc. Fastenings and supports must be adequate to support their loads with a safety factor of at least five.

C. All equipment, switches, jacks, outlets, cables, etc., must be clearly, logically and permanently marked during installation. All cables must be marked with standard alphanumeric markers at each end. These marker codes must be identical to those noted on the shop drawings.

D. The Contractor must take such precautions as are necessary to prevent and guard against electromagnetic/electrostatic/radio frequency interference.

E. Care must be exercised in wiring, so as to avoid damage to the cables and to the equipment between racks, cabinets, consoles or modules all cables must be well supported and must be neatly laced and dressed. All joints and connections must be made with rosin-core solder or with mechanical connectors approved by the Commissioner. Between racks, cabinets, consoles or modules, all cable must terminate in terminal connectors, strips, blocks or boards.

F. All power and high level circuits must be run on the right side of the rack or cabinet as viewed from the rear. All other circuits must be run on the left side as viewed from the rear.

G. Microphone and 600-ohm line conduits must be mechanically and electrically connected to receptacle boxes. Microphone line shields must be grounded only at the end that terminates at the equipment rack(s) and must be grounded only to the common ground of the equipment rack. All audio grounds in the equipment rack(s) must be electrically grounded to the isolated ground buss bar mounted in each rack. Buss bar in each rack then must be grounded to a single point at the isolated ground panel buss bar by means of a minimum AWG #4 insulated conductor. The grounding conductor conduit must be totally electrically isolated from the equipment racks and from the isolated ground panel by means of plastic bushings or other similar approved means.

H. The total resistance of the ground system from the equipment racks to the common building ground must not exceed .1 ohm.

I. Other shields must be grounded only at the power amplifier inputs or the console outputs, and must be terminated at the "floating" end with "wedge on" collars, or with plastic tape. Continuity of shield must be preserved at connecting points.

J. Final location of all equipment must be located as shown on the drawings, or as located in the field by the Commissioner, or as shown on supplementary drawings.

K. Drawings are diagrammatic and indicate general arrangement of systems and work included. Follow drawings in laying out work and check drawings of other trades relating to work to verify spaces in which work will be installed. Maintain headroom and space conditions to all points.

L. Provide a laminated functional diagram for system equipment that reflects the final as-built systems where directed in the field by Commissioner.

M. Equipment racks must be pre-wire in Contractor's shop and thoroughly tested for proper signal flow and equipment function prior to delivery of racks to the job site.

N. Between racks, cabinets, remote receptacles, all speaker and control level cable must terminate in terminal strips where applicable.

O. Drawings are diagrammatic and indicate general arrangement of systems and work included. Follow drawings in laying out work and check drawings of other trades relating to work to verify spaces in which work will be installed. Maintain headroom and space conditions to all points.

P. Final location of all equipment must be located as shown on reviewed shop drawings, or as located in the field by the Commissioner.

3.4 WORKMANSHIP

A. The installation of all work must be neat. All work, equipment, etc., must be plumb and square.

B. The Contractor must keep the job adequately staffed at all times. Unless illness, loss of personnel, or other circumstances beyond the control of the Contractor intervene, they must keep the same individual in charge throughout its execution and must exercise engineering supervision over the entire installation and must inspect the installation at least twice prior to acceptance testing.

C. Following installation, all soiled, abraded or discolored surfaces of work installed herein will be cleaned and left free from blemishes or defects.

D. Work that is damaged or improperly installed will be removed and replaced and the entire installation left in complete satisfactory condition.

E. Any damage brought about by Contractor's work must be repaired at no cost to the City of New York.

F. It will be the responsibility of the Contractor to cooperate with other trades in order to achieve well-coordinated progress and satisfactory final results. They must watch for conflicts with work of other trades on the job and execute, without claim for extra payment, moves or changes as are necessary to accommodate other equipment or preserve symmetry and pleasing appearance.

3.5 CLEANING

A. The Contractor must remove from the job site all rubbish and refuse at the end of each day and must keep their work area clean.

B. Following Installation, all soiled, abraded or discolored surfaces of work installed herein must be cleaned and left free from blemishes or defects.

C. Work that is damaged or improperly installed must be removed and replaced and the entire installation left in complete satisfactory condition.

D. Clean the areas affected by the Work to a level of operational cleanliness.

E. Uncover all areas protected during fabrication. Dispose of covering material and debris accordingly.

3.6 ACCEPTANCE TESTING - GENERAL

A. Upon completion and wiring checkout and initial tests of the systems by Contractor, notify Commissioner in writing that systems are ready for inspection.

B. Contractor must demonstrate the operation of each component of the system to the Commissioner.

3.7 SYSTEM TESTS AND ADJUSTMENTS

A. Initial tests and adjustments must be performed by the Contractor. Furnish all equipment necessary and perform all work required to determine or modify the performance of the system in accordance with the specifications. The contractor must carry out the following inspections of the AV system and submit to the Commissioner the written results for inclusion on the permanent records of the AV system.

B. Verify signal flow through the entire system.

C. Measure and record the frequency response of each mixer/preamp in the system.

D. Measure and record the impedance of each loudspeaker line before connecting it to the output of its respective amplifier, and confirm that it is equal to or above the rated impedance.

E. Measure and record the phasing of all loudspeakers.

F. Balance the levels of the loudspeakers to assure even coverage and level.

G. Program systems to provide optimum audio quality.

H. Establish the normal settings for all level controls and note for reference in the Operation Manual. All level controls on rack-mounted equipment must be adjusted for optimum signal to noise ratio and signal balance and must then be capped, where possible, to prevent tampering.

I. Test Documentation: The following documents must be provided:

1. List of personnel and certified test equipment used.

2. Impedance of all loudspeakers lines.

3. Polarity and phase measurements of the loudspeakers.

J. Equipment Tests:

1. If any equipment does not appear to be functioning properly, further tests may be performed to determine whether it meets the pertinent specifications. Any measurements deemed necessary by the Commissioner may be made to determine proper function.

K. Cable Tests:

1. All network cable must be tested and certified for performance in accordance with the cable type specified.

2. Audio cable must be tested for continuity and decibel bandwidth.

3.8 COMPLETION AND NOTIFICATION

A. Upon completion of installation of equipment and wiring checkout, notify Commissioner.

3.9 ACCEPTANCE TESTING

A. Contractor must demonstrate operation of each component of the systems to the Commissioner. Written notice must be at least ten days prior to that date.

B. When Final Acceptance testing has concluded to the Commissioner's satisfaction. Contractor must submit a written request for Final Acceptance. Guarantees, warranties and service contracts will commence upon written notification of Final Acceptance by the Commissioner.

3.10 INSTRUCTION

A. Within two working weeks of system acceptance, the Contractor must commence a series of instruction sessions for persons designated by the City of New York. A total of eight (8) hours of instruction, at mutually acceptable times, must be provided during a two-week period. Contractor must submit names and period of attendance of those instructed.

END OF SECTION 27 41 00

SECTION 28 00 00 – ELECTRONIC SAFETY AND SECURITY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SECTION INCLUDES

A. Provide all labor, materials, equipment, and services and perform all operations required to complete the installation of all work of this section and related work as indicated on the drawings and specified herein, including, but not necessarily limited to the following:

1. Rack and wall mounted security devices in IT Closet.
2. IP Security cameras, PoE switches and network video recorder.
3. Door contacts/door position switches.
4. Motion Detectors.
5. Hold up button.
6. Proximity reader.
7. Access control boards and electronics.
8. Alarm systems.
9. Power supplies.
10. All devices indicated on the ITS drawings and required cable.

B. Provide installation of all assemblies specified herein including termination of all cable for a complete and fully functioning system. Minor items not specifically mentioned in the specification, but necessary for fully functioning systems, must be included without claim for additional payment.

C. Verify dimensions and conditions at the project site.

D. Submit shop drawings for review prior to fabrication.

E. Fabricate and assemble security systems in accordance with these specifications, equipment manufacturer's recommendations and all New York City Building Code requirements.

F. Coordinate work with other trades of adjoining and related work.

G. Inspect, align and final adjust completed installation. Demonstrate the operation of the completed security system installation for acceptance by Commissioner. Submit final documentation as described herein.

H. 8 hours of instruction of operating personnel.

1.3 RELATED WORK

A. Division 26 – Electrical Work

B. Section 27 10 00 “Structured Cabling”

C. Section 27 41 00 “Audio-Video Systems”

1.4 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 014000 “Quality Requirements”.

B. The system must be comprised of components that are of professional quality. The Contractor must be approved by the manufacturer of the specified security network system unless specifically exempted from this requirement by the Commissioner.

C. The Contractor must have successfully provided installation and engineering services over completed installations for a period of three years and must have completed similar system installations of this type.

1.5 INDUSTRY STANDARDS

A. Regulatory Agencies: Work must be carried out in conformance with the requirements of New York City Building and Electrical Codes, OSHA, Underwriter's Laboratories, National Association of Sound Contractors, Electronic Industries association and the National Fire Protection Association.

1.6 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.7 SUBMITTALS

A. In addition to DDC General Conditions, provide the following. Scaled drawings must be provided for review prior to fabrication:

1. Wiring and interconnection diagrams of system components including notation of type and manufacturer of all items. Include cable types and quantities (using the contract drawing as a basis), connection types, cable numbering scheme, etc. (scale as required). Any discrepancies between the contract drawings and the system requirements must be brought immediately to the attention of the Commissioner.
2. Point to point riser diagram for all devices indicating cable type and quantity.
3. All shop drawings must be CAD generated. Portable thumb drives with as-built drawing files must include in the final system documentation material turned over to City of New York including all control system programming files.
4. A 3” x 5” must be reserved in the lower right corner of each drawing for the Commissioner’s review stamp.
5. Drawings used in the fabrication and installation of the systems specified herein

must bear the Commissioner's stamp.

6. Review of shop drawings will not be considered as a guarantee of measurements of building conditions. Where drawings are indicated as having been reviewed, said review does not mean that drawings have been checked in detail, and said review does not in any way relieve the Contractor from the responsibility or necessity of furnishing material or performing work as required by the Contract Specifications.

1.8 FINAL SUBMITTALS

A. Within thirty days of the Acceptance Tests, the Contractor must furnish the following:

1. Two thumb drives with as-built shop drawings in PDF and DWG format must be turned over to the City of New York.
2. One copy of shop drawings must be emailed to the Commissioner.
3. Thumb drives must include electronic files of instruction, operation and maintenance information book, all block and schematic diagrams, wiring diagrams and technical manuals of system components.
4. The instruction information must also include a written description of system operation procedures to supplement instructing activities. The system description must include pictorial views of operator adjustable settings with normal settings indicated for future restorations of system setting.

1.9 DELIVERY, STORAGE AND HANDLING

A. The equipment to be furnished hereunder must be delivered to the building upon receipt of written notice that secure storage facilities are available.

B. Liaison must be made between the Contractor and the authorized personnel at the project site for safe storage of components being shipped. The requirements for safe handling and storage of these components must be coordinated between these two parties.

1.10 COMPONENT ENCLOSURES

A. General: housings, power supply enclosures, detector control and terminal cabinets, control units, writing gutters and other component housings, collectively referred to as enclosures, must be so formed and assembled as to be sturdy and rigid.

B. Thickness of metal in-cast and sheet metal enclosures of all types must not be less than those in Tables I and II, UL611. Sheet steel used in fabrication of enclosures must not be less than 16 gauge.

1.11 WARRANTY

A. Manufacturer's Warranty for Security Products: Manufacturer must warrant systems and equipment to be free of defective components, faulty workmanship or improper adjustment for warranty period.

1. Warranty Period: 1 year from date of Substantial Completion.

PART 2 – PRODUCTS

2.1 TERMINATION EQUIPMENT

A. Rack mounted equipment must be installed in IT rack specified elsewhere.

2.2 IP CAMERAS

A. All cameras must be the manufacturer's newest model similar to or more advanced than the model numbers listed in the specification at the time of physical installation.

B. Sole Source Product:

1. Type A Interior Camera, Elevator
   a. Sole Source Product: P9106-V by Axis Communications
   b. No substitution will be permitted.

2. Type B Interior Camera, high res
   a. Sole Source Product: Axis P3267 -LV by Axis Communications
   b. No substitution will be permitted.

3. Type C Interior Camera
   a. Sole Source Product: Axis P3265 -LV by Axis Communications
   b. No substitution will be permitted.

4. Type D Interior Camera, Exterior
   a. Sole Source Product: P3267-LVE by Axis Communications
   b. No substitution will be permitted.

5. Type E Interior Camera, 360 degree
   a. Sole Source Product: P3727-PLE by Axis Communications
   b. No substitution will be permitted.

2.3 NETWORK VIDEO RECORDER

A. The Network Video Recorder (NVR) must be a network based video record device to record all cameras that are part of the project.

B. NVR hard drive storage must be as required to store video recording of all cameras for up to 2 weeks.

1. Manufacturer
   a. Sole source product: Network video recorder Genetec VMS, Current version

b. No substitution will be permitted.

2.4 REQUEST TO EXIT INFRARED MOTION DETECTORS & MOTION SENSORS

A. Each egress door with electronic access must include a request to exit passive infrared motion detector (REX-PIR) to signal the DE and the ESS of authorized door opening from the non-protected side (staff side) except for building perimeter doors. The bypass period must be field definable.

B. The REX-PIR must be a double relay contact configuration.

C. The Request to Exit Motion Detector must be connected to the request to exit contact input for the card reader. Activation of the ESS REX circuit must be programmed to unlock the egress lock via the ESS. The REX must not arm and relock from the bypass mode until the door returns to the closed position. A door held open beyond the allowable shunt time must generate a door held alarm on the ESS.

1. Manufacturer
   a. Sole source product: Motion detector, Bosch DS150i (white)
   b. No substitution will be permitted.

2.5 HOLD UP BUTTON

A. Provide HOLD-UP push button where called for on the drawings, tied into alarm system.

1. Manufacturer

   a. Sole source product: Termination equipment, United Security Products HUB2S4
   b. No substitution will be permitted.

2.6 ANALYTICS SOFTWARE

A. The software will have the following features:

1. Detects and responds to people and vehicles intruding on the premises.
2. Alerts if people have been in a selected area for too long.
3. Manage entrances after hours.
4. Remotely manage the entry of visitors, maintenance personnel etc.
5. Receive alerts if a door has been forced or held open.
6. Settings include area and 3 exclude areas per profile (10 point polygons) Up to 3 concurrent profiles.
7. Visual confirmation to verify setup False Alarm Filtering for swaying objects, short-lived objects and small objects
8. Configuration Web configuration (plug-in free) Scenarios
9. Supports event streaming to VMS, including VMD 3 events.
10. Integrates with camera event management system to enable event streaming to Video Management Software
11. Manufacturer.

a. Sole source product: Analytics software, Genetec.
b. No substitution will be permitted.

2.7 MAGNETIC DOOR CONTACT/POSITION SENSOR

A. Provided in hardware specification.

2.8 MOTION SENSOR

A. Provide motion detectors where called for on the drawings, tied into alarm monitoring electronics.

B. Cable to run to the alarm processor /intrusion detection system.

C. The sensor must be UL listed and must be designed for ceiling mounting. The PIR detector uses alternate polarity pulse count. It can be mounted on the surface, or semi-flush directly to a ceiling or a standard octagonal electrical box.

D. The sensor must provide a protected area circular coverage range of 360 deg x 24’-0”. The recommended mounting height is 2.2 m to 3.6 m (7.5 ft to 12 ft).

E. The sensor must operate on a supply voltage of 9 to 15 VDC with a maximum current consumption of 22 mA at 12 VDC. The sensor must provide a Form-C alarm contact rated at 125 ma, 28 VDC, a tamper contact rated at 125 mA, 28 VDC, and a Form-B trouble contact rated at 25 mA, 30 VDC.

1. Manufacturer.
   a. Sole source product: Bosch ISC-9936
   b. No substitution will be permitted.

2.9 ELEVATOR CONTROL SYSTEM

A. All wiring must be provided for the elevator to permit for the installation of a camera and card reader on the interior of the elevator cab.

2.10 FIRE ALARM AND LIFE SAFETY

A. Coordinate the access control system equipment and interface with the electrical contractor who provides fire alarm panel.

2.11 CARD READER

A. Supports mutual use of iCLASS and HITAG1 in a single contactless card. Supports iCLASS SE platform – Ensures superior privacy protection with AES standard cryptography for data authenticity and privacy through the multi-layered security of HID Global´s SIO data model.

B. Complies with ISO/IEC standards for thickness and use with all direct to card or

thermal transfer printers.

1. Manufacturer:
   a. Sole source product: Card Reader, HID Global iClass.
   b. No substitution will be permitted.

2.12 ALARM PANEL, KEYPAD AND SIREN

A. Commercial fire and partitioned burglary alarm panel with eight hardwired zones standard, expandable to 120V-Plex addressable points/zones or 127 wireless points/zones.

B. Supports additional V-Plex expansion Zones.

C. Accommodates 150 user Codes with 7 authority levels.

D Logs up to 513 events.

E. Alarm Panel Manufacturer

1. Sole source products: Alarm panel, Honeywell Vista 250BPT.
2. No substitution will be permitted.

F. Alarm Panel Keypad

1. Sole source product: Alarm Panel Keypad: Honeywell/Ademco 6460.
2. No substitution will be permitted.

G. Alarm Siren/Bluelight – Located on Exterior Ballard

1. Sole source product: 301SET by ATW Security.
2. No substitution will be permitted.

2.13 ACCESS CONTROL

A. The Access Controller is an intelligent, fully distributed 32-bit access control panel that provides facility protection even if communications have been interrupted. This unit connects directly to a network. Each panel can control two wired doors.

B. Access control boards must interface with the electrical contractor who provides the life safety system to confirm compliance with all New York City Building Code requirements. This includes, but is not limited to, the fire alarm interface, fail safe/secure locking mechanisms etc.

1. Manufacturer.
   a. Sole source product: Access control, Sielox 2700 Boards.
   b. No substitution will be permitted.

2.14 COMPONENT ENCLOSURES

A. Power supply enclosures in the IT room, detector control and terminal cabinets, control units, and other component housings, collectively referred to as enclosures, must be a steel assembly as to be sturdy and suitable for wall mounting.

B. Sheet steel used in fabrication of enclosures must not be less than 14 gauge. Doors and covers must be flanged. Where doors are mounted on hinges with exposed pins, the hinges must be of the tight pin type or the ends of hinge pins must be peened or tack welded. Maximum door edge length for a single lock less than 24 inches provide an additional lock for each 24 inch increment of length.

2.15 DOOR BELL

A. Provide a momentary contact button and associated power supply at the exterior entry bollard.

B. Provide interior door bell ring chime connected to the exterior doorbell.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Broan-NuTone LA11WH or comparable product by one of the following:

a. Newhouse
a. Ring
c. Or approved equal

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL

A. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation. Refer to the Riser/Connection diagram for all schematic system installation/termination/wiring data.

B. All equipment must be attached to walls and ceiling/floor assemblies and must be held firmly in place. Fasteners and supports must be adequate to support the required load.

C. The Contractor must visit the site and verify that all work prepared by other trades to receive work of this Section and report any defects affecting installation to the commissioner for correction. The Contractor must not take any corrective action without written permission from the Commissioner. Commencement of work will be construed as complete acceptance of preparatory work by other trades.

D. Contractor must attend project meetings with Commissioner, related trades, to provide coordination of installation and to anticipate conflicts with equipment installation.

E. The following provisions apply to system wiring requirements:

1. All wiring must be installed in conduit, cable tray or raceway. Conduit fill must not exceed 40 percent of interior cross sectional area where three or more cables are contained within a single conduit.
2. Cable must be separated from any open conductors of Power, or Class 1 circuits, and must not be placed in any conduit, junction box or raceway containing these conductors, as per NEC Article 760-29.
3. Wiring for low voltage control and similar power-limited auxiliary functions may be run in the same conduit as initiating and signaling line circuits provided the cable are individually shielded. All circuits must be provided with transient suppression devices and the system must be designed to permit simultaneous operation of all circuits without interference or loss of signals.
4. All electronic security system copper wire or fiber optic cable must meet the requirements of the security equipment manufacturer.
5. All security system wiring must be new. All existing wiring not noted for reuse must be removed.
6. Wiring must be in accordance with New York City electrical code and as recommended by the manufacturer of and compatible with the security system. Number and size of conductors must be as recommended by the security system manufacturer, but not less than 24 AWG solid copper conductors.
7. All wire and cable must be listed and/or approved by a recognized testing agency for intended application and use with a protective signaling system.
8. Wire and cable not installed in conduit must have a fire resistance rating suitable for the installation as indicated in NFPA 70 (e.g., FPLR).
9. Wiring used for the multiplex communication loop must be twisted and shielded and installed in conduit unless specifically excepted by the security equipment manufacturer.
10. All field wiring must be completely supervised. In the event of a primary power failure, disconnected standby battery, removal of any internal modules, or any open circuits in the field wiring; a trouble signal will be activated until the system and its associated field wiring are restored to normal condition.
11. Wiring conductors provided in elevator hoist ways and traveling cables must be listed and approved for elevator use. Conductor insulation must be TFN, TFFN, THWN, THHN or other insulation designated as Flame Retardant. Insulation rating must equal or exceed the maximum normal circuit voltage applied to any conductor within the cable or raceway.

F. When mounting card readers or other devices that require accessibility coordinate with the Commissioner and other trades to ensure ADA requirements are being met.

G. Doors with both a card reader and automatic door operator push plate should have both of these devices placed next to each other where possible.

H. Card readers should generally be 42” above finished floor.

I. On the pull side of a door, card readers should be mounted 48” from the door jamb so that a wheelchair would be clear of the swing of the door.

J. The Contractor's or subcontractor's main resources within the project must carry proper professional certification issued by the manufacturer and verified by a third-party organization to confirm sufficient product and technology knowledge.

K. The Contractor must carefully follow instructions in documentation provided by the manufacturer to ensure all steps have been taken to provide a reliable, easy-to-operate system.

L. All equipment must be tested and configured in accordance with instructions provided by the manufacturer prior to installation.

M. All firmware found in products must be the latest and most up-to-date provided by the manufacturer, or of a version as specified by the provider of the Video Management Application (VMA) and Network Video Recorder (NVR).

N. All equipment requiring users to log on using a password must be configured with user/site-specific password/passwords. No system/product default passwords must be allowed.

O. A proper installation must meet NEC per the guidelines of that year's revision. When properly installed equipment meets Low Voltage, Class 2 classification of the NEC.

3.3 WIRING

A. Provide wiring within cabinets installed parallel with or at right angles to the sides and back of the enclosure. All conductors which are terminated, spliced, or otherwise interrupted in any enclosure associated with the security system must be connected to terminal blocks. Mark terminals in accordance with the wiring diagrams of the system. Make all connections with approved pressure type terminal blocks. Terminal blocks must be secured in each junction box, either to the back of the junction box or junction box cover plate. Wiring management systems must be used in all control panel and power supply cabinets.

B. Cables installed in plenums must meet UL 910, and cables to be installed in risers must meet UL 1666.

C. No cable splices will be permitted.

D. The Contractor must distinctively color code all wiring differently from the normal building wiring. Identify conductors by plastic-coated, self-sticking, printed markers or by heat-shrink type sleeves. Wire the alarm initiating and notification signal devices so that removal will cause the system trouble device to sound. Each conductor used for the same specific function must be distinctively color coded. Use two different color codes for each interior alarm circuit; one for each loop. Each circuit color code wire must remain uniform throughout circuit.

E. All cable management systems and circuit boards must be permanently attached to cabinets, junction boxes and racks. Only mechanical fasteners such as plastic or nylon fixed foot circuit board standoffs, metal machine screws, self-tap screws or rivets must

be utilized to attach circuit boards and cable management systems. Self-tap screw tips must not protrude outside a cabinet. The use of self-adhesive tape as a sole mounting method is prohibited.

F. Wire installation is not specifically detailed in the Contract Documents. Determine conductor requirements for each device in accordance with the Contract Documents and manufacturer requirements.

G. Install cable in accordance with Security System manufacturer requirements and NEC.

H. Color code and terminate conductors consistently as follows:

1. Red for positive and black for negative DC power leads.
2. White for positive and green for negative alarm loop conductors.

I. Fasten cables to the cable support systems and provide strain relief to protect cables and ensure compliance with required cable bends.

J. Keep cable not run in conduit a minimum of 18” from high voltage (120 VAC and above) circuits (e.g. light fixtures, wire run parallel with conduit, transformers, electric panels, etc.).

L. Run cables at least six inches from the communications cable plant, intercom wires, input/output wires, and siren wires.

M. Route wire and cable as required to prevent interference and signal contamination of both Security System cable and cable associated with other systems. Coordinate the routing of wire and cable requiring isolation from power, radio frequency (RF), telephone, etc.

N. Provide sleeves and code compliant fire proofing techniques for all penetrations of fire rated partitions, masonry walls, and slabs, where the penetrations are made by or used for installation of Security Systems.

O. Separate high voltage (120 VAC and above) cables from low voltage cables within enclosures to comply with NEC requirements.

P. Fasten approved wire management hardware (bridle rings, j-hooks, etc.) to the building structure at least every 10 feet where not in conduit. Do not lay or fasten cables to electrical conduits, light fixtures, piping, mechanical equipment, or ceiling grids.

Q. Run wire and cable continuous from device location to the final point of termination. No mid-run cable splices will be allowed.

R. Visually inspect wire and cable for faulty insulation prior to installation of wall and ceiling finishes.

S. Provide bushings, grommets, and strain relief material where necessary to prevent abrasion of wire and excess tension on wire and cable.

T. Wire nuts are not an acceptable means of connecting wire and cable.

U. Make cable connection for device terminations with crimp type connectors. Connectors must provide a hermetic seal and test probe access such that the circuit may be checked without breaking the connection.

V. Neatly install and terminate wire and cable within DGP's, power distribution cabinets and other security enclosures. Pull cables tight, remove slack, and route in such a way as to al- low direct, unimpeded access to the equipment within the enclosure.

3.4 TERMINAL BOXES, JUNCTION BOXES AND CABINETS

A. All boxes and cabinets must be UL listed for their use and purpose. Screws extending outside any cabinets must be cut off and filed smooth to prevent any injury.

B. The security 120 VAC power supplies must be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit must be labeled at the main power distribution panel as Security. Security 120 VAC primary power wiring must be 12 AWG. The control panel cabinet must be grounded securely to a suitable ground.

C. All enclosure penetrations must be from the bottom unless the system design requires penetrations from other directions. Penetrations of interior enclosures involving transitions of conduit from interior to exterior, and all penetrations on exterior enclosures must be sealed with rubber silicone sealant to preclude the entry of water. The conduit riser must terminate in a hot-dipped galvanized metal cable terminator. The terminator must be filled with an approved sealant as recommended by the cable manufacturer, and in such a manner that the cable is not damaged.

D. All field welds and brazing on factory galvanized boxes, enclosures, and conduits must be coated with a cold galvanized paint containing at least 95 percent zinc by weight.

3.5 FIRE STOP SYSTEMS

A. All penetrations through fire rated building structures, walls and floors must be sealed with an appropriate fire stop system. This requirement applies to through penetrations (complete penetration) and membrane penetrations (through one side of a hollow fire rated structure). Any penetrating items i.e., riser slots and sleeves, cables, conduit, cable tray, and raceways, etc. must be properly fire stopped.

B. Fire stop systems must be UL Classified to ASTM E8 14 (UL 1479) and must be approved by a qualified Professional Engineer (PE), licensed in the state of New York. A drawing showing the proposed fire stopped system, stamped/embossed by the PE must be provided to the Commissioner prior to installing the fire stop system(s).

C. All fire stop systems must be installed in accordance with the manufacturer's recommendations and must be completely installed and available for inspection by the special inspector prior to cable system acceptance.

3.6 IP CAMERAS

A. The Contractor must install all system components in accordance with the manufacturer's instructions, and must furnish all necessary cables, connectors, terminators, interconnections, services and adjustments required for a complete and operable video system.

B. The Contractor must install the cameras as indicated for each area; connect signal lines to the camera; where appropriate, aim camera to give field of view as needed to cover the alarm zone; aim fixed mount cameras.

C. Mounts: The Contractor must install the camera mount as specified by the manufacturer and as shown; provide mounting hardware sized appropriately to secure the mount, camera and housing.

3.7 ELECTRONIC SECURITY SYSTEM (ESS)

A The Contractor must install the ESS in accordance with the standards for safety, NFPA 70, UL 681, UL 1037, UL 1076, and the appropriate installation manual for each equipment type. Components within the system must be configured with appropriate service points to pinpoint system trouble in less than 20 minutes.

B. Proximity Card Readers: Locate readers where shown on the drawings. Provide recessed back boxes in which the reader operating will be mounted. Mount readers with bottom of reader approximately even with the door handle. The bottom of the card reader must be no less than 35 inches above the finished floor. The top of the card reader must be no higher than 41 inches above the finished floor. The location of the card reader must be coordinated so that the card reader is beyond the swing of the door when the door swings outward in the direction of the card reader. RM-4 Modules for elevator cab applications must be installed behind cab control panel cover. Card reader location in elevator cab must be coordinated into the elevator cab control button plan.

C. Motion Sensor Passive Infrared Sensors: Locate sensors as shown on the drawings on manufacturer recommended/provided mounting boxes. The appropriate mounting boxes must be provided so that the mounting box does not extend beyond the surface edge of the detection device. Detectors located on the ceiling must be installed not less than 4-inches from a side wall to the near edge. The installation must comply with the requirements of manufacturer.

D. Locate the Data Gathering Panel where indicated on the drawings. Surface mount the enclosure with the top of the cabinet 1830 mm above the finished floor or center the cabinet at 1520 mm, whichever is lower.

E. Software Installation: The Contractor must load all software as specified and required for an operational ESS, including databases and all specified programs. Upon successful completion of the acceptance test, the Contractor must provide original and backup copies on approved media of all accepted software including diagnostics.

F. Quality Control: The following requirements supplement the Contractor quality control

requirements specified elsewhere in the contract. The Contractor must provide the services of technical representatives who are thoroughly familiar with all components and installation procedures of the installed EECS; and are approved by the Commissioner. These representatives will be present on the job site during the preparatory and initial phases of quality control to provide technical assistance. These representatives must also be available on an as needed basis to provide assistance with follow-up phases of quality control. These technical representatives must participate in the testing and validation of the system and must provide certification that their respective system portions meet its contractual requirements.

3.8 CAT 6 CABLING

A. The Contractor must supply permanent identification labels for each cable at each end that will appear on the as-built drawings. The labeling format must be identified and a complete record must be provided to the City of New York with the final documentation. Each cable must be identified by type or signal being carried and termination points.

B. The Contractor must provide all personnel, equipment, instrumentation, and supplies necessary to perform all testing.

C. The Contractor must test each Cat 6 cable. The Contractor must prepare reports containing test results and must certify in the reports conformance to the following requirements.

D. Conductors and cable must be UL approved for its intended application and must meet all national, state, and New York City Building code requirements for its application.

E. Patch Cables

1. Provide pre-manufactured patch cables (cable, connectors, boots, etc.) as required to connect security systems to voice and data communication outlets.
2. Patch cables must be certified for their specific use to meet or exceed applicable industry specifications (e.g. EIA/TIA, ETL, UL, CSA, etc.).
3. Provide cable lengths as necessary to neatly route cables through cable management systems and other cable organization systems.
4. Provide connectors as required for proper termination. Provide boots for connectors where applicable to prevent snagging.
5. Provide Cat 6 patch cables as required for the connections of each camera to camera PoE switch.

F. Minimum Conductor and Cable Types and Sizes

1. Low Voltage Power Cable - 18 AWG, stranded, plenum, insulated, and jacketed.
2. Card Reader Cable: 22 AWG (6 conductors minimum), stranded, plenum, shielded, insulated, and jacketed.
3. Alarm Point Monitoring Cable - 20 AWG (4 conductors minimum), stranded, plenum, insulated, shielded and jacketed.
4. Control Point Cable- 18 AWG, stranded, plenum, insulated, and jacketed.

5. Camera signal /POE cable - Cat 6

G. Camera PoE Network Switch

1. Rack mounted network switch must have 48 ports with enough power over ethernet capacity to power all cameras.
2. Switch must have 10/100/1000 capacity.

3.9 LABELING

A. All labels must be based on final door and room numbering scheme.

B. Mark all connectors with common designations for mating connectors. Indicate connector designations on the record drawings.

C. Permanently mark all terminals. Terminal and cable markings must agree with markings shown on as-built drawing.

D. Neatly coil and secure spare conductors in the ceiling, device backbox or panel wireway.

E. Neatly bundle cable with zip ties or Velcro and tag each wire.

F. Label equipment including, but not be limited to DGPs (label to denote DGP address), power supplies and NVR, and termination cabinets. Coordinate names, fonts, styles, and devices to be labeled with ITS security operations prior to labeling.

G. Identify power circuits and breaker locations within each power supply cabinet.

H. Labels must be computer generated and fastened to conductors/cables with transparent heat shrink material. Hand-written labels will not be accepted.

I. Equipment Labeling

1. Engraved plastic with contrasting letter colors. b. Half-inch minimum size lettering
2. Fasten labels with permanent adhesive.
3. Label wires and cables as follows:
   a. Mark all wire and cable in common at both ends.
   b. Install markers to be readable from left to right or top to bottom. Locate labels near termination points.
   c. Install labels when wire and cables are installed.
   d. Labeling must agree with record documentation.

4. All Access control panels will be assigned a unique account number by IT security operations after the contractor submittals have been reviewed. Labels on each Access control panel must read: “ACCT: XXXX”. XXXX represents a 4 digit account number.

3.10 SYSTEM TESTS AND ADJUSTMENTS

A. Test the system and each subsystem in accordance with the procedures outlined as follows:

1. Verify the absence of unwanted voltages between circuit conductors and ground. The test must be accomplished at the preliminary test with results available at the final system test.
2. Test both primary and secondary power. Verify, by test, the secondary power system is capable of operating the system for the time period and in the manner specified.
3. Determine that the system is operable in a power outage condition as specified.
4. Visually inspect all wiring.
5. Test the system for all specified functions in accordance with the contract drawings and specifications and the manufacturer's operating and maintenance manual.
6. Verify that the video surveillance system meets the specified video quality and that cameras are viewing the intended scene.
7. Verify the operation of all input/output terminals.

B. The contractor must maintain a spare parts inventory necessary to resolve component failures of the system. Spare part inventory must include the following:

1. DGP boards
2. Card readers
3. Power supplies
4. Door position switches

C. Copper Cable Testing:

1. All pre-fabricated cables must be factory tested for continuity before shipment. Contractor must submit documentation to prove the cables have been tested by the manufacturer to industry standards.
2. Contractor must provide a thorough testing program for the communications cabling plant including final acceptance testing. Contractor must provide procedures, a list of test equipment and operating instructions before the tests.
3. Subsystems must be tested individually before testing for end-to-end connectivity. All faults must be corrected and retested. All test results must be completely documented by Contractor.
4. For all cable that fails manufacturer's or specified testing criteria, the contractor must correct the problem or replace the cable or defective component at no additional expense to the City of New York.
5. Contractor must provide two (2) hard copies and one (1) electronic copy (Microsoft Excel or PDF format) of a summary of results for all cables and equipment tested, including: cable ID, strand ID (for fiber optic cables), cable length, and pass/fail result.
6. All test results must be submitted in a sequential, organized fashion, as per the Specification and/or project schedule.
7. The Commissioner reserves the right to independently test any or all of the cable plant. If more than 3% of the tested cable plant within a floor, system or area fails, the Contractor will be required to take the following actions at no additional cost to the City of New York.

D. Test Process:

1. The Commissioner reserves the right to be present during any or all of testing.
2. Testing must be of the Permanent Link. However, Contractor must warrant performance (see Part 3) based on Channel performance and provide patch cords that meet channel performance.
3. All cabling not tested strictly in accordance with these procedures must be re-tested at no additional cost to the City of New York.
4. 100% of the installed cabling must be tested. All tests must pass specified acceptance criteria.
5. Test equipment must be fully charged prior to each days testing.
6. Standards Compliance & Test Requirements
   a. Copper cabling must meet TIA 568B Category 6.

7. Documentation
   a. Test reports must be submitted in electronic format. Hand-written test reports are not acceptable.
   b. An attached affidavit verifying passing execution of all tests. For large installations electronic reports are preferred. Summary reports must contain the following information on each row of the report: circuit ID, test specification used, length, date of test, and pass/fail result.
   c. Reports must be accompanied by a Certificate signed by an authorized representative of the Contractor warranting the truth and accuracy of the electronic report. Certificate must reference traceable circuit numbers that match the electronic record.
   d. Test reports must include the following information for each cabling element tested.
      1) Wiremap results that indicate the cabling has no shorts, opens, miswires, split, reversed, or crossed pairs, and end to end connectivity is achieved.
      2) For Category 6 cabling tests results must include the following test results:
         a) Attenuation, Near End Cross Talk (NEXT)
         b) Power Sum Alien Next (PSANEXT)
         c) Power Sum Near End Crosstalk (PSNEXT)
         d) Insertion Loss (IL)
         e) Return Loss (RL)
         f) Attenuation to CrossTalk Ratio-Far End
         g) Power Sum Attenuation to Cross Talk Ratio - Near End (PSACR-N)
         h) Power Sum Alien Attenuation to Crosstalk Ratio - From Far End (PSAACRF)
         i) Far End Crosstalk (FEXT).
         j) Power Sum Attenuation to Crosstalk Ratio - Far End (PSACRF)
         k) Length
         l) Propagation Delay
         m) Delay Skew

3) Data that indicate the worst case result, the frequency at which it occurs, the limit at that point, and the margin. These tests must be performed in a swept frequency manner from 1 MHz to highest relevant frequency, using a swept frequency interval that is consistent with TIA and ISO requirements. Information must be provided for all pairs or pair combinations and in both directions when required by the appropriate standards. Any individual test that fails the relevant performance specification must be marked as a FAIL.
4) Length (in meters), propagation delay, and delay skew relative to the relevant limit. Any individual test that fails the relevant performance specification must be marked as a FAIL.
5) Cable manufacturer, cable model number/type, and NVP.
6) Tester manufacturer, model, serial number, hardware version, and software version.
7) Circuit ID number, date and project name.
8) Autotest specification used.
9) Overall pass/fail indication.

3.11 TESTING

A. Conduct a complete security system test of each alarm point and signal and document results on checklist. The intent of this test is to verify proper system operation and ensure accuracy of system programming prior to functional testing.

B. The following activities must take place to complete the installation of the security system. Documentation of activities, corrective action items and status, and activity completion verification must be provided to the Contractor for inclusion in the Commissioning and Closeout Manual.

1. Pre-functional Tests (PFT)
   a. Test and document security device connections with a multi-meter to verify proper termination and operation.

2. Operational Field Testing with IT.
   a. Submit updated security system program sheets and completed PFT checklist to City of New York.
   b. Operational Field Testing can be scheduled once the communications cabling subcontractor has completed the portion of the voice and data network which supports the new security system.
   c. The completed PFT form will initiate the IP address for each security control panel.

3. Functional Tests (FT)
   a. Contractor must provide two sets of preliminary as-built drawings to the Commissioner at least 30 days before the FT process is scheduled to start.
   b. Once PFT and operational field testing procedures have been documented and completed, the final FT walkthrough can begin. The contractor must demonstrate to the Commissioner during a full walkthrough inspection that

the completed and integrated system complies with the contract documents, initial instruction is complete, and the system is fully operational.

4. Integrated System Test (IST)
   a. Test critical system interfaces such as fire alarm and elevators.

3.12 FINAL ACCEPTANCE REQUIREMENTS

A. All alarm points and devices must be fully installed and operational.

B. Any punch list items are completed.

C. Final Documentation has been submitted and accepted.

END OF SECTION 28 00 00

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 28 08 00 COMMISSIONING OF ELECTRONIC SAFETY AND SECURITY

PART I – GENERAL

1.1. RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2. SUMMARY

A. Commissioning consists of systematically documenting that specified components and systems have been installed and started up properly and then functionally tested to verify and document proper operation through all sequences of operation and conditions. In addition, instruction of The City of New York's Operations Personnel must be verified and final project O&M Documents must be reviewed for completeness.

1.3. QUALITY ASSURANCE

A. Reference Standards:

1. OSHA Part 1910; Subpart S. 1910.308.
2. American National Standards Institute: ANSI
3. American Society for Testing and Materials: ASTM
4. National Electrical Manufacturers Association: NEMA
5. National Fire Protection Association: NFPA
    a. National Electrical Code (NEC)
    b. National Fire Alarm and Signaling Code

B. All inspections and tests must use the following references.

1. Contract Specifications.
2. Contract Drawings.
3. Manufacturer's instruction manuals and approved shop drawings for applicable equipment.

PART II – PRODUCTS

2.1. EQUIPMENT AND INSTRUMENTS FOR Cx PROCESS

A. The Contractor must furnish all tools, instruments, laptops, calibrated meters, software programs, personnel, and services required to perform the commissioning process. This includes providing the connection to systems to be tested, temporary alterations for test purposes, calibrations, operation of the test equipment & instrumentation and generating test results (as required), and the restoration of equipment/systems to original operating condition. A list of all tools and equipment to be used during commissioning must be submitted to the CxA for approval. The Contractor must furnish necessary utilities for the commissioning process.

B. Proprietary test equipment and software required by any equipment manufacturer for programming and/or start-up, whether specified or not, must be provided by the manufacturer of

the equipment. Proprietary test equipment (and software) must become the property of The City of New York upon completion of the commissioning process.

2.2. COMMISSIONING DOCUMENTATION

A. All documentation for the commissioning process must be entered into the CxA's commissioning project progress tracking software tool. The Contractor must be allowed web-based access to the software upon request. Additionally, the Contractor may download the the CxA's mobile application to a tablet format. The mobile application is available in Apple, Android, and Windows format. There is no fee associated with the software or the mobile application. Contractor must allow sufficient time to become familiar with the operation of the software.

PART III – EXECUTION

3.1. GENERAL

A. The Contractor must complete all phases of work so the systems can be started, tested, balanced, and acceptance procedures undertaken. This includes the complete installation of all equipment, materials, pipe, wire, insulation, controls, etc., per the contract documents and related directives, clarifications, and change orders.

3.2. PARTICIPATION IN ACCEPTANCE PROCEDURES

A. The Contractor must provide skilled technicians to startup and debug all systems within the project contracted work. These same technicians must be made available to assist the Commissioning Authority in completing the commissioning program. Work schedules, time required for testing, etc., must be requested by the Commissioning Authority and coordinated by the Contractor. Contractor must ensure that the qualified technician(s) are available and present during the agreed upon schedules and of sufficient duration to complete the necessary tests, adjustments, and/or problem resolutions.

B. System performance problems and discrepancies may require additional technician time, Commissioning Authority time, reconstruction of systems, and/or replacement of system components. At no additional cost to The City of New York, the additional technician time must be made available for subsequent commissioning periods until the required system performance is obtained.

C. The Commissioning Authority reserves the right to question the appropriateness and qualifications of the technicians relative to each item of equipment, system, and/or sub-system. Qualifications of technicians must include expert knowledge relative to the specific equipment involved and a willingness to work with the Commissioning Authority. Contractor must provide adequate documentation and tools to start-up and test the equipment, system, and/or sub-system.

3.3. DEFICIENCY RESOLUTION

A. In some systems, inaccurate adjustments, misapplied equipment, and/or deficient performance under varying loads must result in additional work being required to commission the systems. This work must be completed under the direction of The Commissioner, with input from the Contractor, equipment supplier, and Commissioning Authority. Whereas all members must have input and the opportunity to discuss, debate, and work out problems, The City of New York

and/or Commissioner must have final jurisdiction over any additional work done to achieve performance.

B. Corrective work must be completed in a timely fashion to permit the completion of the commissioning process. Experimentation to demonstrate system performance may be permitted. If the Commissioning Authority deems the experimentation work to be ineffective or untimely as it relates to the commissioning process, the Commissioning Authority must notify The Commissioner, indicating the nature of the problem, expected steps to be taken, and suggested deadline(s) for completion of activities. If the deadline(s) pass without resolution of the problem, The City of New York reserves the right to obtain supplementary services and/or equipment to resolve the problem. Contractor must provide supplementary services incurred to solve problems at no additional cost to the City of New York.

3.4. ADDITIONAL COMMISSIONING

A. Additional commissioning activities may be required after system adjustments, replacements, etc., are completed. The Contractor, suppliers, and Commissioning Authority must complete this work at no additional cost to the City of New York.

3.5. SUSTAINING SYSTEM READINESS

A. The Commissioning Authority must prepare and issue to the Contractor Pre-Functional Checklist (PFC) forms for each system or major piece of equipment to be commissioned. Pre-Functional Checklists are important to ensure that the equipment and systems are installed and operational. It ensures that Functional Performance and Integrated Systems Testing may proceed without unnecessary delays. Each piece of equipment is to receive full pre-functional checkout by the Contractor. No sampling strategies are to be used. The Pre-Functional Checklists for all equipment related to any given system must be successfully completed prior to formal Functional Performance and Integrated Systems Testing of the system.

B. The Commissioning Authority must monitor and track the completion of the Pre-Functional Checklist forms.

C. The Contractor must complete the Pre-Functional Checklists, provided by the Commissioning Authority, as follows:

1. Pre-Functional Checklists should be maintained in a binder(s) or electronically at the Contractor's project site office and are subject to review for comparison between the completion level of the Checklists and the status of the work during site observation visits by the Commissioning Authority.

2. Complete Section 1 "Equipment Delivery" of the Pre-Functional Checklist after equipment delivery to the site.

3. Complete Section 2 "Equipment Installation" of the Pre-Functional Checklist after the equipment installation is complete.

4. Complete Section 3 "Equipment Start-up" of the Pre-Functional Checklist after the equipment has been successfully started. The Contractor is to forward copies of all manufacturer's start-up forms and reports to the Commissioning Authority.

5. Complete Section 4 "Notification for Testing" of the Pre-Functional Checklist after the equipment if fully operational and ready for Functional Performance and Integrated Systems Testing.

6. Completed and signed Pre-Functional Checklists are a pre-requisite for commencing Functional Performance and Integrated Systems Testing. If field observation indicates a significant deviation from actual installation conditions, all checklists must be returned to the Contractor for revision and resubmission at no additional cost to the City of New York.

7. Only individuals that have direct knowledge and witnessed that a line item task on the Pre-Functional Checklist was actually performed must initial or check off that item.

D. The Contractor must clearly list any outstanding items from the Pre-Functional Checklists and/or manufacturer start-up reports and checklists that were not completed successfully in the Comments section of the applicable Pre-Functional Checklist. The Commissioning Authority must review any items/issues listed and must address them through discussion with the Commissioner prior to proceeding with Functional Performance and Integrated Systems Testing.

E. The Contractor must develop detailed start-up plans for all equipment. These plans must be reviewed by the Commissioner and the Commissioning Authority for completeness and verification that the manufacturer-recommended procedures have been completed.

1. The Contractor responsible for the installation and start-up of the equipment is responsible for developing the start-up plan by combining the Pre-Functional Checklist with the manufacturer's detailed start-up and checkout procedures and any required quality assurance testing.

2. The Contractor must maintain an updated and annotated copy of the start-up plan that must be accessible for review by the Commissioner and the Commissioning Authority at periodic intervals.

3. The completed start-up procedures must be provided along with the completed Pre-Functional Checklists to the Commissioning Authority prior to the Contractor's certification that the systems are ready for Functional Performance and Integrated Systems Testing.

3.6. FUNCTIONAL PERFORMANCE TESTING

A. The CxA must provide to the Contractor functional performance tests (FPTs). The Contractor must review the test procedures, so that proper preparation may occur. The Contractor must execute the FPT document and prove to The Commissioner and the Cx Authority that the performance of the Fire Alarm Systems achieves the performance level identified. Refer to all other specification sections for other systems that may need to be tested. The following systems are to be commissioned but not limited to:

1. Fire Alarm System:
   a. Fire Alarm Control Panel (FACP)
   b. New Initiating Devices
   c. New Annunciation Devices
2. Security System

B. Detailed testing must be performed on all installed equipment and systems to ensure that operation and performance conform to contract documents. All tests must be witnessed by the

Commissioning Authority. The following testing is required as part of the commissioning process:

1. Verification tests are comprised of a full range of checks and tests to determine that all components, equipment, systems, and interfaces between systems operate in accordance with contract documents. This includes all operating modes, interlocks, control responses, and specific responses to abnormal or emergency conditions.
2. Functional Performance Tests (FPT) must determine if the Fire Alarm system is in accordance with the finalized design intent.

3.7. ROLES AND RESPONSIBILITIES

A. Contractor

1. Assure acceptable representation, with the means and authority to prepare and coordinate execution of the Fire Alarm system commissioning program as described in the contract documents.
2. Attend commissioning meetings scheduled by the CxA.
3. Coordinate inclusion of commissioning activities in the construction schedule.
4. Complete Pre-Functional Checklists and manufacturer's pre-startup checklists prior to scheduling pre-testing of the Fire Alarm system.
5. Issue a notice that Fire Alarm pre-testing has been scheduled.
6. Monitor, respond, and remedy deficiencies identified in the Corrective Issue Reports (CIRs) distributed by the CxA in order to expedite corrective actions necessary to achieve design intent.
7. Facilitate resolution of deficiencies that were identified by observations or performance testing.
8. Participate in the Functional Performance Tests as required to achieve design intent.
9. Participate in O&M Instruction as required by DDC General Conditions.
10. Include requirements for submittal data, O&M data, and instruction in each purchase order or sub-contract written.
11. Ensure participation of major equipment manufacturers in appropriate instruction and testing activities.
12. Attend Construction Phase coordination meeting scheduled by the CxA.
13. Assist the Commissioning Authority in all verification and functional performance tests.
14. Prepare preliminary schedule and include the following tasks that must be executed: Fire Alarm system orientation and inspections, O&M manual submission, instruction sessions, pipe testing, flushing and cleaning, equipment start-up, and task completion for use by the Commissioning Authority. Update schedule as appropriate throughout the construction period.
15. Attend initial instruction session.
16. Conduct Fire alarm system orientation and inspection at the equipment placement completion stage.
17. Update drawings to the record condition to date, and review with the Commissioning Authority.
18. Gather O&M data on all equipment, and assemble in binders as required by DDC General Conditions.
19. Notify the Commissioning Authority a minimum of two weeks in advance, so that witnessing equipment and system start-up and testing can begin.
20. Participate in and schedule vendors to participate in the instruction sessions.

21. Provide written notification to the Commissioning Authority that the following work has been completed in accordance with the contract documents, and that the equipment, systems, and sub-systems are operating as required.
    a. Fire Alarm equipment and all contracted equipment.
    b. Provide a complete set of as-built records to the Commissioning Authority.

3.8. STARTUP

A. The Contractor must follow the start-up and initial checkout procedures listed in this specification and in DDC General Conditions. Division 28 has start-up responsibility and is required to complete systems and sub-systems so that they are fully functional and meet the design objectives of the Contract Documents. The commissioning procedures and functional testing do not relieve or lessen this responsibility or shift that responsibility partially to the commissioning agent or The City of New York.

B. Functional testing is intended to begin upon completion of a system. Functional testing may proceed prior to the completion of systems, or sub-systems at the discretion of the CxA and the Contractor. Beginning system testing before full completion does not relieve the Contractor from fully completing the system, including all Pre-Functional Checklists as soon as possible.

C. Functional testing must occur a minimum of two weeks before FDNY inspection.

Equipment	*Start-Up Required*	*Pre-Functional Checks*			*Functional Checks*		*Notes*
		C	*P*	*W*	*W*	*R*	
Fire Alarm Control Panel (FACP)	N	100 %	30%	-	-	100%	FDNY Inspection
Detection devices (smoke / heat detectors, smoke dampers, etc.)	N	100 %	100 %	-	-	-	
Signaling/notification devices (strobes, pull boxes, bell, etc.)	N	100 %	100 %	-	-	-	

Key	
C	Contractor to perform Pre-functional Check (PFC) provided by CxA
P	CxA to review and verify PFC
W	CxA to witness testing
R	CxA to Review and compile testing documentation

3.9. COMMISSIONING STATUS TRACKING

A. The Contractor must verify that the Tag designation as well as the number (count) of each unit listed is correct against those contained within the initial Contract Documents.

END OF SECTION 28 08 00

SECTION 28 46 20 - FIRE ALARM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract [City of New York Standard Construction Contract].

1.2 SUMMARY

A. Section includes fully addressable zoned and coded fire detection and alarm system

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

A. Provide list of all types of equipment and components provided.

B. Provide manufacturer's printed product data, catalog cuts and description of any special installation procedures.

C. Provide samples of various items when requested.

D. Provide shop drawings as follows:

1. Drawing of the fire alarm control panel.
2. Single line riser diagram showing all equipment and type, number and size of all conductors.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.6 SCOPE

A. The work covered by this Section of the Specification must include all labor, equipment, materials and services to furnish and install a complete fire alarm system of the zoned, automatic and manual, fully addressable type. It must be complete with all necessary hardware, software and memory specifically tailored for this installation. It must be possible to permanently modify the software on site by using a plug-in programmer. The system must consist of, but not be limited to, the following:

B. Fire alarm control panel/system:

1. To be fully addressable and allow for coding of all individual pull stations, smoke detectors, heat detectors, duct detectors, carbon monoxide (CO) detectors, and tamper switches.

2. FACP/system must be capable of closed-circuit wiring.
3. Addressable manual fire alarm stations.
4. Addressable area smoke detectors.
5. Addressable heat detectors.
6. Addressable multi-criteria carbon monoxide and smoke and /or heat detectors
7. Addressable duct smoke detectors for supply fans over 2,000cfm (air handling systems shutdown control). Provide remote LED status indicators where duct detectors are not readily accessible.
8. Audible notification appliances; multi-tone horn (at panel), speaker/strobe combination devices.
9. Visual notification appliances; strobes.
10. Central station alarm connection control.
11. Emergency battery packs.
12. Elevator recall operation
13. Relays for fans shut-down.
14. Security system Interface Module.
15. Devices to be rated for low temperature operation and weatherproof where exposed to ambient conditions.

1.7 APPLICABLE CODES AND STANDARDS

A. All equipment must be UL listed for its intended use.
B. NFPA Standards 72
C. NYC Electrical Code.
D. New York City Fire Department, Bureau of Electrical Control and Building Codes of NYC.

1.8 CENTRAL STATION

A. The Fire Alarm Control Panel must be connected to a Central Monitoring Station via two dedicated phones lines. The provider of the monitoring service must be an approved FDNY Central Station Monitoring firm.
B. Provide the necessary devices as required to allow for the FACP to communicate with the Central Monitoring Station.

1.9 WARRANTY

A. The manufacturer must guarantee the system equipment for a period of one (1) year from date of substantial completion of the system.
B. The contractor must guarantee all wiring and raceways to be free from inherent mechanical or electrical defects for one (1) year from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Sole Source Manufacturer: Edwards Systems Technology.

1. No substitutions permitted.

B. The catalog numbers used in the description below are those of Edwards Systems Technology.

2.2 SYSTEM DESCRIPTION

A. The system supplied under this specification must be a new UL Listed modular fire alarm network that uses independently addressed fire detection devices, input/output control modules, and notification appliances.

B. The network must utilize token ring, peer-to-peer communications. The network must consist of a main panel and remote-control panels. To enhance survivability, each panel must be an equal, active functional member of the network, capable of making all local decisions and initiating network tasks for other panels. In the event of a panel failure or communications failure between panels, panels must be capable of forming sub-networks and remain operational between communicating panels. Master/slave system configurations are not considered as equal.

C. The system must be fully field programmable such that virtually any combination of system output functions may be correlated to any type of input event(s). Inputs may be combined using Boolean logic, be time dependent or under manual control, as defined by required system operation. All software operations are to be stored in a non-volatile programmable memory within the fire alarm control panels. There must be no limit, other than maximum system capacity, as to the number of addressable devices which may be in alarm simultaneously.

D. Addressable smoke detector sensitivity settings for both pre-alarm and alarm activation must be automatically individually configurable for both daytime and nighttime operation. Addressable smoke detectors must be UL listed for automatic sensitivity testing.

E. Ease of maintenance must be facilitated by the use of panel based and PC based system diagnostics.

1. The system must automatically test smoke detector sensitivity, eliminating the need for manual sensitivity testing.

2. Ground fault detection and annunciation must be by individual module address for supervised input and output devices.

3. System test operation must be configurable by individual addressable devices, and not disable entire circuits.

4. The system must be capable of generating a graphical map of connected all addressable devices to aide in circuit troubleshooting.

5. Placement supervision of addressable devices must couple a device's location (not its address) to the programmed system response.

F. The system must be designed, inspected, tested and approved to provide occupant notification audibility levels of 15 dBA over ambient conditions.

G. The system must support CO and security detection devices with appropriate independent annunciation and signal processing.

H. The system must interface with other building systems as required by the fire codes.

I. The system must transmit the required signals to a central monitoring station.

J. System panels and annunciators must utilize configurable message routing and selective event messaging to direct event information only to the required system displays and printers as determined by the event type and location.

2.3 RELATED WORK

A. The Contractor must coordinate work in this Section with all related trades. Work and/or equipment provided in other Sections and related to the fire alarm system must include, but not be limited to:

1. Air handling and smoke exhaust system duct smoke detector interface with fan control circuits and status contacts to be furnished with the HVAC control equipment.

2. Elevators recall control circuits provided with the elevator control equipment.

3. IP network interface

a. Coordinate with Commissioner for interconnection to TCP/IP network equipment.

2.4 CIRCUITING GUIDELINES

A. Each addressable loop must be circuited as shown on the drawings, but device loading is not to exceed 80% of loop capacity in order to leave for space for future devices. The loop must have Class A operation.

B. Where it is necessary to interface conventional initiating devices provide intelligent input modules to supervise Class A zone wiring.

C. For conventional zone annunciation at the control panel zones must be as shown on the zoning schedule, but must be typically as follows:

1. Manual Fire Alarm Stations: Provide one (1) alarm zone for each pull station.

2. Area Smoke Detectors: Provide one (1) alarm zone for each smoke detector.

3. Duct Smoke Detectors at HVAC Air Handling Units: Provide one (1) alarm zone for each air handling unit.

4. Provide one (1) alarm zone for each of the following special areas/equipment:

a. Electrical room.
b. ATS room.
c. Mechanical equipment room.
d. Elevator machine room.
e. IT Room.

D. Each of the following types of alarm notification appliances must be circuited as shown on the drawings but must be typically as follows:

1. Audible Signals: Provide one (1) notification appliance circuit for up to fifteen (15) audible alarm devices.

2. Visual Signals: Provide one (1) notification appliance circuit for up to ten (10) strobes (15/30/75) candela per circuit.

E. Each of the following types of remote equipment associated with the fire alarm system must be provided with a form 'C' control relay contact as shown on the drawings, but must be typically as follows:

1. HVAC Fan Systems: Provide one (1) shutdown control relay contact for each HVAC fan system.

2. HVAC Supply Fans: Provide one (1) shutdown control relay contact for each HVAC supply fan.

3. HVAC Return Fans: Provide one (1) shutdown control relay contact for each HVAC return fan.

4. HVAC Exhaust Systems: Provide one (1) shutdown control relay contact for each HVAC exhaust fan.

2.5 FIRE ALARM SYSTEM SEQUENCE OF OPERATION

A. The system must identify any off normal condition and log each condition into the system database as an event.

1. The system must automatically display on the control panel Liquid Crystal Display the first event of the highest priority by type. The priorities and types must be alarm, supervisory, trouble, and monitor.

2. The system must have queue operation and must not require event acknowledgment by the system operator. The system must have a labeled color-coded indicator for each type of event; alarm - red, supervisory - yellow, trouble - yellow, monitor - green. When an unseen event exists for a given type, the indicator must flash. When all events of a given type have been displayed, the indicator must change from flashing to steady.

3. For each event, the display must include the current time, the total number of events, the type of event, the time the event occurred and up to a 40-character custom user description.

4. The user must be able to review each event by simply selecting scrolling keys (up-down) for each event type.

5. New alarm, supervisory, or trouble events must sound silenceable audible signal at the control panel.

B. Operation of any alarm initiating device must automatically:

1. Update the control/display as described above.

2. Sound all audible alarm signals throughout the building.

3. Turn on all strobe lights throughout the building.

4. Turn on a red alarm zone LED at the fire alarm control panel.

5. Operate the alarm relay contacts to initiate the transmission of an alarm to a central station agency via leased telephone lines.

6. Operate control relay contacts to shutdown all HVAC units serving.

7. Operate control relay contacts to shut down all supply and return dampers.

C. The entire fire alarm system wiring must be electrically supervised to automatically detect and report trouble conditions to the fire alarm control panel. Any opens, grounds or disarrangement of system wiring and shorts across alarm bell/strobe wiring must automatically:

1. Update the control/display as described above.

2. Operate the supervisory relay contacts to initiate the transmission of an alarm to a central station via dedicated telephone lines leased from approved provider.

2.6 FIRE ALRM CONTROL PANEL

A. All materials, equipment, accessories, devices and other facilities and appurtenances covered by these specifications or noted on the drawings must be new, best suited for the intended use and must conform to applicable and recognized standards for their use, and supplied by a single manufacturer.

B. The fire alarm control panel(s) must be a multi-processor based networked system designed specifically for fire and smoke detection. The control panel must be listed and approved for the application standard(s) as listed in the References section of this specification.

C. The control panel must include all required hardware, software and site-specific system programming to provide a complete and operational system. The control panel(s) must be designed such that interactions between any applications can be configured and modified using software provided by the manufacturer. The control panel(s) operational priority must assure that life safety takes precedence among the activities coordinated by the control panel.

D. The operating controls must be located in a dead-front steel enclosure behind a locked door with viewing window. All control modules must be labeled, and all zone locations must be identified. All panel modules must be placement supervised for and signal a trouble if damaged or removed.

E. System Features: Each control panel must include the following capabilities:

1. Supervision of the system electronics, wiring, detection devices and software

2. Up to 2500 analog/addressable input/output points

3. Network connections with up to 63 other control panels and annunciators.

4. Support multiple dialers (DACTs) and modems.

5. Two communication ports

6. An internal audible signal with different patterns to distinguish between alarm, supervisory, trouble and monitor events.

7. Support multiple 24 VDC and Audio NACs

8. User configurable switches and LED indicators to support auxiliary functions.

9. Log up to 1740 chronological events.

10. The ability to download all applications and firmware from the configuration computer at a single location on the fire network.

11. A real-time clock for time stamps and timed event control
12. Electronic addressing of intelligent addressable devices
13. Provide an independent hardware watchdog to supervise software and CPU operation.
14. "Dry" alarm, trouble and supervisory relay contacts
15. Control panel modules must plug in to a chassis assembly for ease of maintenance.
16. Field wiring must connect to the panel using removable connectors.

F. User Oriented Features: Each control panel must include the following user oriented features:

1. An LCD user interface control/display that must annunciate and control system functions.
2. Provide discreet system control switches for reset, alarm silence, panel silence, drill switch, previous message switch, next message switch and details.
3. An authorized user must have the ability to operate or modify system functions including system time, date, passwords, holiday dates, restart the system and clear control panel event history file.
4. An authorized user must have the ability to disable/enable devices, zones, actions, timers and sequences.
5. An authorized user must have the ability to activate/restore outputs, actions, sequences, and simulate detector smoke levels.
6. An authorized user must have the ability to enter time and date, reconfigure an external port for download programming, initiate programming and change passwords.
7. An authorized user must have the ability to test the functions of the installed system.
8. Service groups must facilitate one-man walk testing. Service/test groups must be capable of being configured with any combination of addressable devices, independent of SLC wiring. It must be possible to program alternate device responses when the device's service group is active. Devices not in an active service group must process all events normally.
9. Provide internal system diagnostics and maintenance user interface controls to display/report the power, communication, and general status of specific panel components, detectors, and modules.
10. SLC loop controller diagnostics must identify common alarm, trouble, ground fault, Class A fault, and map faults. Map faults include wire changes, device type changes by location, device additions/deletions and conventional open, short, and ground conditions. Ground faults on the supervised circuit wiring of remote addressable modules must be identified by device address.
11. An authorized user must have the ability to generate a report history for alarm, supervisory, monitor, trouble, smoke verification, watchdog, and restore activity.
12. System reports must provide detailed description of the status of system parameters for corrective action or for preventative maintenance programs. Reports must be displayed by the operator interface or capable of being printed on a printer.

13. An authorized user must have the ability to display/report the condition of addressable analog detectors. Reports must include device address, device type, percent obscuration, and maintenance indication. The maintenance indication must provide the user with a measure of contamination of a device upon which cleaning decisions can be made.

G. Programmability:

1. A Windows-based Configuration Utility (CU) must be used to create the site-specific system programming. The utility must facilitate programming of any input point to any output point. The utility must allow customization of fundamental system operations using initiating events to start actions, timers, sequences and logical algorithms.
   a. Zoning of initiation devices.
   b. Initiation of events by time of day, day of week, day of year.
   c. Initiation of events by matrix groups (X-Y coordinate relationships) for releasing systems.
   d. Initiation of events using OR, AND, NOT and counting functions.
   e. Prioritizing system events.
   f. Programmable activation of detector sounder bases by detector, groups of bases, or all bases.
   g. Directing selected device messages to specific panel annunciators
   h. Detector sensitivity selection by time of day
   i. Support of 256 Central Monitoring Station accounts and directing selected device messages to any one of ten Central Monitoring Stations.
2. The configuration utility must time and date stamp all changes to the site-specific program, and must facilitate program versioning and must store all previous program version data. The utility must provide a compare feature to identify the differences between different versions of the site-specific program.
3. The configuration utility must be capable of generating reports which detail the configurations of all fire alarm panels, addressable devices and their configuration settings including generating electrical maps of the addressable device SLCs.
4. The configuration utility must support the use of bar code readers to expedite electronic addressing and custom programming functions.

H. Power Supply:

1. System power supply(s) must be a high efficiency switched mode design providing multiple supervised power limited 24 VDC output circuits as required by the panel and external loads fed by the panel. Initial power supply loading must not exceed 80% of power supply capacity in order to allow for future system expansion.
2. Each system power supply must be individually supervised. Power supply trouble signals must identify the specific supply and the nature of the trouble condition.
3. It must be possible to parallel system power supplies to increase capacity or to provide redundant operation.
4. Upon failure of normal (AC) power, the affected portion(s) of the system must automatically switch over to secondary power without losing any system functionality.

5. All system power supplies must be capable of recharging their associated batteries, from a fully discharged condition to a capacity sufficient to allow the system to perform consistent with the requirements of this section, in 48 hours maximum.

6. All standby batteries must be continuously monitored by the power supply. The power supply must be able to perform an automatic load test of batteries and indicate a trouble condition if the batteries fall outside a predetermined range. Power supplies must incorporate the ability to adjust the charge rate of batteries based on ambient temperatures. The power supply must automatically disconnect the battery before low voltage damages the battery. Low battery and disconnection of battery power supply conditions must immediately annunciated as battery trouble and identify the specific power supply(s) affected.

7. Batteries must utilize sealed lead acid chemistry. Initial battery capacity must provide 125% of calculated capacity requirements in order to allow for future system expansion.

8. All AC power connections must be to the building's designated emergency electrical power circuit and must meet the requirements of NFPA 70 and NFPA 72. The power circuit disconnect means must be clearly labeled FIRE ALARM CIRCUIT CONTROL and must have a red marking. The location of the circuit disconnect must be labeled permanently inside each control panel the disconnect serves.

2.7 USER INTERFACE

A. Panel LCD and Common Controls

1. The system must be designed and equipped to receive, monitor, and annunciate signals from devices and circuits installed throughout the facility.

2. Each fire alarm control panel (system node) must be capable of supporting a backlit LCD display. The display on each system node must be configurable to display the status of any and/or all combinations of all alarm, supervisory, trouble, monitor, or service group event messages on the network. Each LCD display on the system must be capable of being programmed to allow control functions of any combination of nodes on the entire network. The system must support both 168 character and 960 character LCD displays on the same network.

3. The LCD display must provide separate alarm, trouble, supervisory, and monitor event queues of to minimize operator confusion. Receipt of alarm, trouble, and supervisory signals must activate integral audible devices at the control panel(s) and at each remote annunciation device. The integral audible devices must produce a sound output upon activation of not less than 85 dBA at 10 feet.

4. The LCD display must contain the following system status indicators:

   a. System Power Indicator
   b. System Test Indicator
   c. System CPU Fail Indicator
   d. Ground Fault Indicator
   e. Disabled Points Indicator
   f. System Normal Indicator
   g. System Common Alarm Indicator
   h. System Common Trouble Indicator

i. System Common Supervisory Indicator
j. System Common Monitor Event Indicator

5. The LCD display must contain the following system switch/indicators:
   a. System Reset Switch with Indicator
   b. System Alarm Silence Switch with Indicator
   c. System Panel Silence Switch with Indicator
   d. Drill Switch with Indicator
   e. Alarm Acknowledge Switch with Indicator
   f. Trouble Acknowledge Switch with Indicator
   g. Supervisory Acknowledge Switch with Indicator
   h. Monitor Acknowledge Switch with Indicator
6. The LCD display must contain the following system function switches.
   a. System Event Message Queue Scroll Switch.
   b. Event Details Switch (provides an additional 2000 character message about the device highlighted by the operator.)
   c. Command Menu Switch: 10-Digit Keypad with Enter and Backspace switches
7. The user interface must provide a backlit LCD that will allow custom event messages of up to 42 characters. The interface must provide a minimum of eight lines by 21 characters and provide the emergency user hands free viewing of the first and last highest priority events. The last highest priority event must always display and update automatically. Events must be automatically placed in one of four easy to access queues. It must be possible to scroll through and view specific alarm, trouble, supervisory and monitor events separately. Having to scroll through a mixed list of event types will not be considered as equal. The total number of active and disabled events by type must be displayed. Visual indication must be provided of any event type that has not been acknowledged or viewed. It must be possible to customize the designation of all user interface LEDs and Switches for local language requirements.
8. Instructional text messages must support a maximum of 2,000 characters each.

B. LEDs and Switches
1. A modular series of switches and LED indicators must be available to customize the fire alarm control panel operation in accordance with this specification. All LED and switch functions must be software programmable. Switches must be configurable for momentary, maintained, toggle, or “exclusive or” operation as required by the application. LEDs must be configurable for slow flash, fast flash or steady operation. LED/Switch modules must be capable of mounting in any available fire panel module position. All LED/Switch modules must be supervised. LEDs must be available in a variety of colors to facilitate identification from a distance. The LED/Switch modules must provide ample room for custom function text labels under a protective membrane.
2. The LED/Switch modules must be Edwards System technologies 3-24x series, 3-12xx series, and 3-6/3S1xxx series devices. No substitutions permitted.

C. Reports
1. The system must provide the operator with system reports that give detailed description of the status of system parameters for corrective action, or for preventative maintenance programs. The system must provide these reports via the main LCD, and must be capable of being printed on any system printer.

2. The system must provide a report that gives a sensitivity listing of all detectors that have less than 80% environmental compensation remaining. The system must provide a report that provides a sensitivity (% Obscuration per foot) listing of any particular detector.

3. When addressable CO detectors are installed, performing a "sensitivity" check from the panel must report the approximate number months of sensor life remaining.

4. The system must provide a report that gives a listing of the sensitivity of all of the detectors on any given panel in the system, or any given analog/addressable device loop within any given panel.

5. The system must provide a report that gives a chronological listing of at least the last 1000 system events.

6. The system must provide a listing of all of the firmware revision listings for all of the installed components in the system.

2.8 SIGNALING LINE CIRCUITS

A. Fire Network Wiring:

1. The network inter panel wiring must be Class A The network media must be copper except where fiber optic cable is specified on the drawings.

2. The system supplied under this specification must utilize node to node, direct wired peer-to-peer network operations. The system must utilize independently addressed, smoke detectors, heat detectors and input/output modules, intrusion detection as described in this specification. The peer-to-peer network must contain multiple nodes consisting of the command center, main controller, remote control panels, LCD/LED annunciation nodes, and workstations. Each node is an equal, active functional node of the network, which is capable of making all local decisions and generating network tasks to other nodes in the event of node failure or communications failure between nodes.

3. When a network is wired in a Class B configuration, a single break or short on the network wiring isolates the system into two groups of panels. Each group continues to function as a peer-to-peer network working with their combined databases. When wired using a Class A configuration, a single break or short on the network wiring causes the system to isolate the fault, and network communication continues uninterrupted, without any loss of function. Should multiple wiring faults occur, the network re-configures into many sub-networks and continues to respond to alarm events from every panel that can transmit and receive network messages.

B. Signal Line Circuiting:

1. The signaling line circuit connecting panels/nodes to intelligent addressable devices including, detectors, monitor modules, control modules, isolation modules, intrusion detection modules and notification circuit modules must be Class A (style 6 or 7) All signaling line circuits must be supervised and power limited.

2. When the addressable devices on a signaling line circuit cover more than one designated fire/smoke compartment, a wire-to-wire short on the circuit must not affect the operation of the addressable devices in other fire/smoke compartments.

3. Each SLC must support 125 addressable detector addresses and 125 module addresses. The SLC must support 100% of all addressable devices in alarm and provide support for a 100% compliment of detector isolator bases. Initial circuit loading must not exceed 80% in order to allow for future system expansion.

4. The addressable device SLC module must be UL Listed for use with code compliant, electrically sound existing wiring.

5. Each intelligent addressable device must transmit information about its location with respect to other devices on the circuit. This information must be used to create an "As-Built" wiring diagram as well as provide enhanced supervision of a device's physical location. The device message and programmed system output function must be associated with the device's location on the SLC circuit location and not a device address.

6. The SLC module must allow replacement of "same type" devices without the need to address and reload the "location" parameters on replacement device.

7. The SLC/Panels must notify the user when programmed devices are detected on the SLC circuit. The SLC/Panels must notify the user when the wrong device type is installed at a location configured for a different device type on the SLC circuit.

8. Should an SLC Controller CPU fail to communicate, the SLC circuit must go into the stand-alone mode. The circuit must be capable of producing a loop alarm if an alarm type device becomes active during stand-alone mode to enhance system integrity.

2.9 DEVICE AND APPLIANCE CIRCUITS

A. Notification Appliance Circuits:

1. General:

   a. All notification circuits must be supervised and power limited. Non-power limited circuits are not acceptable. All notification appliance circuits must be Class A.

   b. Initial circuit loading must not exceed 80% to allow for future system expansion.

2. 24V DC Circuits:

   a. Notification appliance circuits must have a minimum circuit output rating of 2 amps @ 24 VDC.

   b. 24VDC NACs must be polarized and provide both strobe synchronization and a horn silence signal on a single pair of wires.

3. Audio Notification Appliance Circuits

   a. Audio notification appliance circuits must be polarized and have a minimum circuit output rating of 50 watts @ 25V audio, and 35 watts @ 70V audio.

B. Initiating Device Circuits:

1. Conventional (2-wire) initiating device circuits monitoring manual fire alarm stations, smoke and heat detectors, waterflow switches, valve supervisory switches, fire pump functions, and air pressure supervisory switches must be Class A.

2. Initiating device circuits monitoring magnetic security contacts, motion detectors, glass break and intrusion type devices must be Class B.

3. Initiating device circuits must be configurable for latched or non-latched operation and configurable to initiate alarm, supervisory or monitor events.

4. End-of-line resistors for conventional initiating device circuits must be covered with insulated tubing, terminated with ring lugs and display a UL label.

2.10 CENTRAL STATION COMMUNICATION

A. Digital Alarm Communication Transmitter (DACT):

1. The system must provide off-premises communications capability using a Digital Alarm Communications Transmitter (DACT) for sending system events to Central Monitoring Station (CMS) receivers over conventional telephone lines.

2. The system must provide the CMS(s) with point identification of system events using 4/2, Contact ID (SIA DC-05) or SIA DCS protocols. The system must also transmit an alphanumeric system activity message, by event, to a commercial paging system, using TAP Pager protocol and an internal V.32BIS.

3. The dialer must support up to 255 individual accounts and to send account information to eight (8) different receivers, each having a primary and secondary telephone access number. System events must be capable of being directed to one or more receivers depending on event type or location as specified by the system design.

4. In the event of a fire alarm panel CPU failure during a fire alarm condition, the DACT degrade mode must transmit a general fire alarm signal to the CMS.

5. Coordinate installation of two (2) dedicated loop-start phone lines to be terminated using two RJ31X jacks within 5 ft of the main fire alarm control panel.

2.11 SMOKE PURGE STATION IN PANEL

A. Integrate a Firefighter's Smoke Purge Station (FSPS) into the main fire alarm panel. The main fire alarm panel must have a UUKL listing for smoke purge control. The FSPS must include switch/LED modules that provide three functions (on/off/auto and open/closed/auto) switches and 4 LED's (normal, on, off, fault or normal, open, closed, fault) for the smoke purge system.

B. The FSPS must function as described in the system operational matrix, found elsewhere in this specification.

C. The FSPS must utilize a 3-function switch for each smoke purge control. Each switch must include On/Off/Auto function for control of smoke control fan systems and Open/Closed/Auto positions for smoke purge shut-off damper.

D. The FSPS must include the following LED indicators for each smoke control system:

1. Fans, dampers, or other operating equipment in their normal status - white indicator. NOTE: The white normal indicator must give the FSPS operator a clear indication that the smoke control equipment is operating properly. Dampers that are not fully open or not fully closed (mid-point) must extinguish the white indicator.

2. Fans, dampers, or other operating equipment in their off or closed position - red indicator

3. Fans, dampers, or other operating equipment in their on or open status - green indicator

4. Fans, dampers, or other operating equipment in fault - yellow indicator

5. Smoke purge control switch and LED modules must include space to label each switch and indicator function.

E. All dampers that are part of the smoke control system must include position verification switches (true open and true closed).

F. Smoke control fan and damper state must not be affected upon fire alarm system reset. Restarting the fans and resetting dampers must be accomplished automatically by turning them back on in an individual sequential fashion or through individual manual switches at the FSPS controls to eliminate the possibility of damaging the ductwork.

2.12 COMPONENTS

A. General

1. Each detector must contain an integral microprocessor which must determine if the device is normal, in alarm, or has an internal trouble. The microprocessor's non-volatile memory must permanently store the detector's serial number, device type and system address. It must be possible to address each intelligent device without the use of switches. Devices requiring switches for addressing will not be considered as equal. Memory must automatically be updated with the hours of operation, last maintenance date, number of alarms and troubles, time of last alarm, and analog signal patterns for each sensing element just before the last alarm.

2. Each detector must be capable of identifying up to 32 diagnostic codes. This information must be available for system maintenance. The diagnostic code must be stored at the detector.

3. Each addressable detector on the Signaling Line Circuit (SLC) must transmit information regarding its location with respect to other intelligent devices on the signaling line circuit to the control panel, creating an "As-Built" circuit map. The circuit mapping function must provide location supervision of all intelligent devices on the signaling line circuit. An intelligent detector's programmed system response functions must be associated with the detector's actual location on the signaling line circuit and not with the detector's address. After system commissioning, detectors improperly installed in the wrong location must function according to the mapped programmed response for its location on the circuit, not its detector's address.

4. A status indicator must be provided on each detector. Flashing green must indicate normal operation; flashing RED must indicate the alarm state. The indicator must be visible from any direction.

5. The system must allow for changing of detector types for service replacement purposes without the need to reprogram the system. The replacement detector type must automatically continue to operate with the same programmed sensitivity levels and functions as the detector it replaced, without the need for reprogramming. System must display an off-normal condition until the proper detector type is installed or a change in the device type profile has been made.

6. Detectors must be rated for operation in the following environment unless specifically noted:

   a. Temperature: 32°F to 120°F (0°C to 49°C)
   b. Humidity: 0-93% RH, non-condensing

7. Detectors located in unconditioned areas and /or exposed to outdoors must be rated for low ambient operating temperature and weatherproofed when exposed to elements.

8. Low Temperature: -4°F

9. Detectors with addressing components in the base will not be considered as equal.

B. Duct Smoke Detector:

1. Provide intelligent low profile photoelectric duct smoke detectors / remote test switches at the locations shown on the drawings.

2. The intelligent duct smoke detector must operate in ducts having from 100ft/min to 4,000ft/min air velocity. The detector must be suitable for operation over a temperature range of -20 to 158F° and offer a harsh environment gasket option. The detector must utilize an air exhaust tube and an air sampling inlet tube that extends into the duct air stream up to ten (10) feet. Design of the detector must permit sampling tube installation from either side of the detector and permit sampling tube installation in 45- degree increments to ensure proper alignment with duct airflow. Drilling templates and gaskets to facilitate locating and mounting the housing must be provided.

3. The intelligent duct smoke detector must obtain information from a photoelectric sensing element. The detector must be able to differentiate between a long term drift above the pre alarm threshold and fast rise above the threshold. The detector must monitor the sensitivity of the smoke sensor. If the sensitivity shifts outside the UL limits, a trouble signal must be sent to the panel.

4. Each detector must utilize an environmental compensation algorithm that must automatically adjust for background environmental conditions such as dust, temperature, and pressure. The detector must provide a maintenance alert signal when 80% (dirty) of the available compensation range has been used. The detector must provide a dirty fault signal when 100% or greater compensation has been used.

5. The intelligent duct smoke detector must provide a form “C” auxiliary alarm relay rated at 2amps @ 30Vdc. The position of the relay contact must be supervised by the control panel software. Operation of the relay must be controlled either by its respective detector processor or under program control from the control panel as required by the application. Detector relays not capable of programmed operation independent of the detector’s state will not be considered as equal. The detector must be equipped with a local magnet-activated test switch.

6. Each duct detector must be installed and testing in accordance with manufacturer’s instructions, including pressure differential and, velocity testing. Test results must be submitted to the Commissioner.

7. Remote test switches/LED indicators must be provided below the detector on the ceiling to indicate location of the detector in non-mechanical areas, at locations indicated on the drawings.

8. The Intelligent Photoelectric Duct Smoke Detector must be an Edwards model SIGA-SD No substitutions permitted.

9. The remote key operated test switch / LED must be Edwards model SD-TRK. No substitutions permitted.

10. Duct Mounting Plate: Where addressable smoke detectors are directly mounted on a low velocity ducts up to 3 ft (0.91m) high x 3 ft (0.91m) wide, provide factory mounting plate assemblies to facilitate mounting the detectors. The mounting plate must be code gauge steel with corrosion resistant red enamel finish. The detector mounting plate must support an addressable detector along with a standard, relay or isolator detector mounting base.

11. The detector mounting plate must be Edwards SIGA-DMP. No substitutions permitted.

12. Duct Detector Housing: Provide smoke detector duct housing assemblies SIGA-DH to facilitate mounting an intelligent photoelectric Detector SIGA-PS along with a standard detector mounting base. Provide for variations in duct air velocity between 300 and 4000 feet per minute (300 to 1000 feet per minute for ion-photo-heat detector). Protect the measuring chamber from damage and insects. Provide an air exhaust tube and an air sampling inlet tube which extends into the duct air stream up to ten feet. Provide drilling templates and gaskets to facilitate locating and mounting the housing. Provide five one gang knockouts for mounting optional Signature Series modules. Finish the housing in baked red enamel. Provide Remote Alarm LED Indicators SIGA-LED and Remote Test Stations SIGA-DTS. No substitutions permitted.

C. Bases:

1. Standard Base:
   a. Provide standard detector bases suitable for mounting on either 1-gang, 3½ or 4 inch octagon box and 4 inch square box.
   b. The bases must utilize a twist-lock design and provide screw terminals for all field wiring connections.
   c. The base must contain no active electronics and support all Signature series detector types.
   d. The base must be capable of supporting a Remote Alarm LED Indicator. Provide remote LED alarm indicators where shown on the plans.
   e. Removal of the respective detector must not affect communications with other detectors.
   f. The standard addressable detector base must be an Edwards SIGA-SB or SB4. No substitutions permitted.
   g. The remote LED indicator must be an Edwards SIGA-LED. No substitutions permitted.

2. Relay Base:
   a. Provide relay detector bases suitable for mounting on either 1-gang, 3½ or 4 inch octagon box and 4 inch square box.
   b. The bases must utilize a twist-lock design and provide screw terminals for all field wiring connections.
   c. The base must contain no electronics and support all Signature series detector types.
   d. Removal of the respective detector must not affect communications with other detectors.
   e. The relay base must meet the following requirements:
      1) The relay must be a bi-stable type and selectable for normally open or normally closed operation.
      2) The position of the relay contact must be supervised.

3) The operation of the base relay must be configurable for control by its respective detector or for independent programmable control from the fire alarm panel. Relay bases not configurable for detector or panel operation will not be considered equal.
4) The base relay must provide form "C" contacts with a minimum rating of 1 amp @ 30 Vdc and be listed for pilot duty.

f. The standard addressable relay detector base must be an Edwards SIGA-RB or RB4. No substitutions permitted.

3. Sounder Base:

a. Provide audible detector mounting bases suitable for mounting on a 1-gang, 3½ or 4 inch octagon box and 4 inch square box.
b. The bases must utilize a twist-lock design and provide screw terminals for all field wiring connections.
c. Removal of the respective detector must not affect communications with other detectors.
d. The audible base must support all detector types and must be capable of single or group operation.
e. The audible base must emit a temporal 3-3-3 fire alarm tone when smoke or heat has been detected. The audible base must emit a temporal 4-4-4-4 CO alarm tone when CO has been detected. The outputs must be configurable for low or high output by moving a reversible jumper. The system must be UL2017 listed for dual signaling for this purpose.
f. The audible bases must provide a UL-268 reverberant room sound output of 90.8 dBA at 10ft (3m) for temporal 3-3-3 fire alarm and 84.1 dBA at 10 ft.(3m) for temporal 4-4-4-4 CO alarm.
g. The detector sounder base must be an Edwards SIGA-AB4GT. No substitutions permitted.

4. Isolator Base:

a. Provide isolator detector bases suitable for mounting on 1-gang, 3½ or 4 inch octagon box and 4 inch square box.
b. The bases must utilize a twist-lock design and provide screw terminals for all field wiring connections.
c. The base must support all Signature series detector types.
d. Isolator bases must limit number of modules or detectors that may be rendered inoperative by short-circuit fault on SLC loop segment or branch. In the event the Class A signaling line circuit on which the isolator bases are installed is shorted, each base must open the SLC. Isolator bases must then sequentially reconnect the isolated circuit segments until only the segment with the short is left out of the circuit, leaving the balance of the circuit operational.
e. The Isolator Base must be an Edwards SIGA-IB or SIGA-IB4. No substitutions permitted.

D. Smoke Detector Guards:

1. Smoke detector guards must be installed at the locations shown on the drawings.

2. The guards must be UL tested and listed by for use with the smoke detectors they protect. Guard design must not affect the detector operating sensitivity and must not reduce the listed detector spacing.

3. The design of the guard must provide physical protection for the detector while preventing looped items from hanging on the guard when wall mounted or being threaded through the guard.

4. The guards must be constructed of 18-gauge steel with a baked white finish to match the detectors. Tamperproof mounting hardware must be provided.

5. The Smoke Detector Guards must be Edwards SIGA-GRD. No substitutions permitted.

E. Manual Stations:

1. Provide addressable single action, two stage fire alarm stations at the locations shown on the drawings.

2. The manual station must be suitable for mounting on North American 2 ½ (64mm) deep 1-gang boxes and 1 ½ (38mm) deep 4 square boxes with 1-gang covers. If indicated as surface mounted, provide manufacturer's surface back box.

3. The fire alarm station must be of metal construction, must be finished in red with silver "PULL IN CASE OF FIRE" lettering, must show visible indication of operation and incorporate an internal toggle switch for first stage alarm and key switch for second stage alarm.

4. The manual pull station will have an addressable module integral to the unit.

5. Manual pull stations that initiated an alarm condition when opening the unit are not acceptable.

6. The addressable single action two stage manual fire alarm station must be an Edwards SIGA-270P. No substitutions permitted.

7. Guards:

a. Provide manual pull station guards at the locations shown on the drawings.
b. The guard must consist of a factory-fabricated clear polycarbonate enclosure, hinged at the top. Lifting the cover must provide access to the manual pull station and activate an integral battery powered audible horn intended to discourage false alarms.
c. The manual pull station guards must Edwards STI-1000 Series. No substitutions permitted.

F. Heat Detectors (320-AW-135):

1. Edwards Series 302 heat detectors suitable for use in indoor and outdoor environments and explosive atmospheres. No substitutions permitted.

2. Normally-open devices designed to close an electrical circuit upon activation. All models feature rate compensation and are available with either 135°F (57.2°C) or 194°F (90°C) ratings.

3. These self-restoring, hermetically sealed detectors are shock-, corrosion- and tamper-resistant.

4. Surface or box mount style based on location.

G. Modules:

1. General:

a. Intelligent addressable multifunction modules must be provided at the locations shown on the drawings to provide the specific system input and output functions described by the operation section and functional matrix found elsewhere in this specification.
b. The operation of multifunction modules must be software configurable at the site to meet operational conditions and may be changed at any time by download changes from the control panel. The intelligent multifunction modules must utilize electronic addressing. Modules using rotary or DIP switches, memory chips and / or jumpers for addressing are not be considered as equal.
c. Each intelligent multifunction module on the Signaling Line Circuit (SLC) must transmit information regarding its location with respect to other intelligent devices on the signaling line circuit to the control panel, creating an "As-Built" circuit map. The circuit mapping function must provide location supervision of all intelligent devices on the signaling line circuit. An intelligent device's programmed system response functions must be associated with the device's actual location on the signaling line circuit and not with the device's address. After system commissioning, devices improperly installed in the wrong location must function according to the mapped programmed response for its location on the circuit, not its device address.
d. All input /output status decisions must be made by the microprocessor within the module. Communications with a control panel must not be required in order for the module to identify off-normal input/output conditions. Modules with supervised input or output circuits must be capable of identifying ground fault conditions down to the module address level.
e. Each module must be equipped with two (2) diagnostic indicators; a green LED to confirm communications and a red LED to display active status. LEDs must be visible through the finished cover plate. The module must be capable of storing a unique serial number and up to 24 diagnostic codes, hours of operation, number of alarms and troubles, and time of last alarm in its memory which can be retrieved for troubleshooting.
f. Modules must be rated for operation in the following environment:
   1) Temperature: 32°F to 120°F (0°C to 49°C)
   2) Humidity: 0-93% RH, non-condensing

g. Where multiple modules are mounted in close proximity to each other, plug-in modular versions of the modules and motherboards must be available to minimize field wiring and facilitate troubleshooting.
h. The addressable multifunction modules must Edwards Signature Series devices. No substitutions permitted.
i. Modules must be rated for ambient temperatures and weatherproofed when located in unconditioned spaces and/or outdoors.

2. Relay:
   a. Provide addressable control relay modules at the locations shown on the drawings.
   b. The module must be suitable for mounting on a North American 2 ½" (64mm) deep 1-gang box or 1 ½" (38mm) deep 4" square box with 1-gang covers.
   c. The module must provide one (1) form C dry relay contacts rated at 24Vdc @ 2 amps (pilot duty) to control external appliances or equipment. The position of the relay contact must be confirmed by the system firmware. The relay coil must be

magnetically latched to reduce wiring and ensure 100% of the relays on the SLC can be energized at same time.

d. The addressable control relay module must be an Edwards SIGA-CR or MCR. No substitutions permitted.

3. Isolation Module:

a. Provide addressable isolator modules at the locations shown on the drawings.

b. The module must be suitable for mounting on North American 2½" (64mm) deep 1-gang boxes and 1½" (38mm) deep 4" square boxes with 1-gang covers.

c. In the event the Class A signaling line circuit on which the intelligent isolator module is installed is shorted, each module must open the SLC. Isolator modules must then sequentially reconnect the isolated circuit segments until only the segment with the short is left out of the circuit, leaving the balance of the circuit operational.

d. SLC isolation must be provided for each floor or protection zone of building.

e. The addressable Isolator Module must be an Edwards SIGA-IM. No substitutions permitted.

4. Universal Modules

a. Provide intelligent universal Class A/B multifunction modules at the locations shown on the drawings.

b. The module must be suitable for mounting on 2½" deep 2-gang boxes and 1½" deep 4" square boxes with 2-gang covers.

c. Each universal module must be configurable as one of the following "personalities."

1) Two (2) supervised Class B Normally-Open Alarm Latching. (for alarm initiation applications)

2) Two (2) supervised Class B Normally-Open Alarm Delayed Latching. (for waterflow switch applications)

3) Two (2) supervised Class B Normally-Open Active Non-Latching. (for limit switch and monitor applications)

4) Two (2) supervised Class B Normally-Open Active Latching. (for tamper switch and supervisory applications)

5) One (1) form "C" dry relay contact rated at 2 amps @ 24 Vdc. (for circuit control applications)

6) One (1) supervised Class A Normally-Open Alarm Latching. . (for alarm initiation applications)

7) One (1) supervised Class A Normally-Open Alarm Delayed Latching. . (for waterflow switch applications)

8) One (1) supervised Class A Normally-Open Active Non-Latching. (for limit switch and monitor applications)

9) One (1) supervised Class A Normally-Open Active Latching. . (for tamper switch and supervisory applications)

10) One (1) supervised Class A 2-wire Smoke Alarm Non-Verified. (for alarm initiation applications)

11) One (1) supervised Class B 2-wire Smoke Alarm Non-Verified. (for alarm initiation applications)

12) One (1) supervised Class A 2-wire Smoke Alarm Verified (for alarm initiation applications)

13) One (1) supervised Class B 2-wire Smoke Alarm Verified(for alarm initiation applications)

14) .One (1) supervised Class A Signal Circuit, 24Vdc @ 2A.(for occupant notification applications)
15) One (1) supervised Class B Signal Circuit, 24Vdc @ 2A. .(for occupant notification applications)

d. Each module must identify and report ground faults, opens and shorts associated with its supervised input / output circuits, by device address, to the control panel. Single function modules or without individual ground fault detection identification capability are not considered as equal.

e. The Universal Class A/B Module must Edwards SIGA-UM. No substitutions permitted.

H. Notification Appliances:

1. General:

a. All appliances supplied for the requirements of this specification must be UL Listed for Fire Protective Service and must be capable of providing the "equivalent facilitation" which is allowed under the Americans with Disabilities Act Accessibilities Guidelines (ADA(AG)) and must be UL 1971 Listed.

b. All appliances must be of the same manufacturer as the fire alarm control panel specified to ensure absolute compatibility between the appliances and the control panels, and to ensure that the application of the appliances are done in accordance with the single manufacturer's instructions.

c. Any appliances that do not meet the above requirements and are submitted for use must show written proof of their compatibility for the purpose intended. Such proof must be in the form of documentation from all manufacturers that clearly states that their equipment (as submitted) is 100% compatible with each other for the purpose intended.

d. All strobes must be provided with lens markings oriented for wall mounting. Exterior mounted devices must be provided with a weatherproof backbox.

e. All visual appliances must be synchronized. Light and audible output levels must be designed to meet ADA and NFPA requirements.

f. All notification appliances must be white unless noted otherwise on the drawings.

2. Horns:

a. Provide low profile wall mounted horns at the locations shown on the drawings.

b. Low profile horns must mount in a North American 1-gang box and protrude less than 1" from the finished wall. The word FIRE must be prominently displayed on the housing.

c. The horns must provide an audible output of 85 dBA at 10 ft. when measured in reverberation room per UL-464 and have a selectable steady or synchronized temporal (3-3-3) output pattern.

d. Horn power, horn silencing, and strobe synchronization must be accomplished over a single pair of wires. In and out screw terminals must accommodate 18AWG to 12 AWG wiring and have captive hardware.

e. The horns must be Edwards Genesis G1 Series. No substitutions permitted.

3. Horns Weatherproof:

a. Provide low profile weatherproof horns at the locations shown on the drawings.

b. The weatherproof horns must mount in a North American 4" square 1 ½"deep electrical box for indoor applications and a factory supplied back box for weatherproof applications.

c. The horns must be suitable for wall or ceiling mount and operate in temperatures from -40 to 151 degrees F. The word FIRE must be prominently displayed on the housing.
d. The horn must provide a user configurable high/low audible output of 89.7/85.4 dBA @ 10' for a steady output and an 84.2/81.7 4 dBA @ 10' for a temporal (3-3-3) output when measured in reverberation room per UL-464.
e. Horn and strobe power, horn silencing, and strobe synchronization must be accomplished over a single pair of wires. In and out screw terminals must accommodate 18AWG to 12 AWG wiring and have captive hardware.
f. The weatherproof horns must be Edwards Genesis WG4 Series. No substitutions permitted.

4. Strobes:

a. Provide low profile wall mounted strobes at the locations shown on the drawings.
b. Low profile strobes must mount in a North American 1-gang box, and protrude less than 1" from the finished wall. The word FIRE must be prominently displayed on the housing.
c. The strobe output must be switch selectable as required by its application from the following available settings: 15cd, 30cd, 75cd & 110cd. Selected strobe rating must be visible when the strobe is in its installed position. Amber lens strobes must be available with outputs of 12/24/60/88cd. Light must be evenly distributed throughout the required volume using cavity and mask "FullLight" technology to prevent hot spots. Strobes using specular reflectors will not be considered as equal.
d. When multiple strobes are installed within view of each other, their outputs must be synchronized within ten (10) milliseconds of each other for an indefinite period without the need for separate synchronization modules.
e. Horn and strobe power, horn silencing, and strobe synchronization must be accomplished over a single pair of wires. In and out screw terminals must accommodate 18AWG to 12 AWG wiring and have captive hardware.
f. The strobes must be Edwards Genesis G1 Series. No substitutions permitted.

5. Strobes Weatherproof:

a. Provide low profile weatherproof strobes at the locations shown on the drawings.
b. The weatherproof strobes must mount in a North American 4" square 1 ½"deep electrical box for indoor applications and a factory supplied back box for weatherproof applications.
c. The strobe must be suitable for wall or ceiling mount and operate in temperatures from -40 to 151 degrees F. The word FIRE must be prominently displayed on the housing.
d. The strobe output must be switch selectable as required by its application from the following available settings:

		Standard Candela Output Strobes				**High Candela Output Strobes**			
		Strobe Switch Position							
Listing	**Location**	**D**	**C**	**B**	**A**	**D**	**C**	**B**	**A**

UL 1971	Indoor	15 cd	29 cd	70 cd	87 cd	102 cd	123 cd	147 cd	161 cd
UL 1638	Outdoor (-35C)	6 cd	12 cd	28 cd	35 cd	41 cd	50 cd	60 cd	65 cd

e. Selected strobe rating must be visible when the speaker-strobe is in its installed position
f. When multiple strobes are installed within view of each other, their outputs must be synchronized within ten (10) milliseconds of each other for an indefinite period without the need for separate synchronization modules.
g. Horn and strobe power, horn silencing, and strobe synchronization must be accomplished over a single pair of wires. In and out screw terminals must accommodate 18AWG to 12 AWG wiring and have captive hardware.
h. The weatherproof strobes must be EDWARDS Genesis WG4 Series. No substitutions permitted.

6. Horn- Strobes:
   a. Provide low profile wall mounted horn-strobes at the locations shown on the drawings.
   b. Low profile horn-strobes must mount in a North American 1-gang box, and protrude less than 1” from the finished wall. The word FIRE must be prominently displayed on the housing. The word FIRE <ALERT> must be prominently displayed on the housing.
   c. The horn-strobe must provide an audible output of 85 dBA at 10 ft. when measured in reverberation room per UL-464, and have a selectable steady or synchronized temporal (3-3-3) output pattern.
   d. The strobe output must be switch selectable as required by its application from the following available settings: 15cd, 30cd, 75cd & 110cd. Selected strobe rating must be visible when the horn-strobe is in its installed position. Amber lens strobes must be available with outputs of 12/24/60/88cd. Light must be evenly distributed throughout the required volume using cavity and mask “FullLight” technology to prevent hot spots. Strobes using specular reflectors must not be considered as equal.
   e. When multiple strobes are installed within view of each other, their outputs must be synchronized within ten (10) milliseconds of each other for an indefinite period without the need for separate synchronization modules.
   f. Horn and strobe power, horn silencing, and strobe synchronization must be accomplished over a single pair of wires. In and out screw terminals must accommodate 18AWG to 12 AWG wiring and have captive hardware.
   g. The horn-strobes must be Edwards Genesis G1 Series. No substitutions permitted.
7. Horn-Strobes Weatherproof:
   a. Provide low profile weatherproof horn-strobes at the locations shown on the drawings.
   b. The weatherproof horn-strobes must mount in a North American 4” square 1 ½”deep electrical box for indoor applications and a factory supplied back box for weatherproof applications.

c. The horn-strobe must be suitable for wall or ceiling mount and operate in temperatures from -40 to 151 degrees F. The word FIRE must be prominently displayed on the housing.

d. The horn-strobe must provide a user configurable high/low audible output of 89.7/85.4 dBA @ 10' for a steady output and an 84.2/81.7 4 dBA @ 10' for a temporal (3-3-3) output when measured in reverberation room per UL-464.

e. The strobe output must be switch selectable as required by its application from the following available settings:

		Standard Candela Output Strobes				**High Candela Output Strobes**			
		Strobe Switch Position							
Listing	**Location**	**D**	**C**	**B**	**A**	**D**	**C**	**B**	**A**
UL 1971	Indoor	15 cd	29 cd	70 cd	87 cd	102 cd	123 cd	147 cd	161 cd
UL 1638	Outdoor (-35C)	6 cd	12 cd	28 cd	35 cd	41 cd	50 cd	60 cd	65

f. Selected strobe rating must be visible when the speaker-strobe is in its installed position

g. When multiple strobes are installed within view of each other, their outputs must be synchronized within ten (10) milliseconds of each other for an indefinite period without the need for separate synchronization modules.

h. Horn and strobe power, horn silencing, and strobe synchronization must be accomplished over a single pair of wires. In and out screw terminals must accommodate 18AWG to 12 AWG wiring and have captive hardware.

i. The weatherproof horn-strobes must be Edwards Genesis WG4 Series. No substitutions permitted.

I. Accessories:

1. Magnetic Door Holders.

a. Provide floor mounted or wall mounted fail safe electromagnetic door holder. Coordinate with Architectural and Low Voltage systems dwgs.

b. Holders must provide approximately 25-lbf nominal holding force when energized. The units must have an aluminized finish and contain no moving parts. The contact plate must have an integral nylon swivel to absorb shock and adjust to any door angle.

c. Flush and semi-flush models must be designed for concealed wiring applications and must mount on standard 1-gang electrical box. Floor mounted electromagnet units must consist of a floor plate, gaskets, and housing. Incoming conduit must connect directly into floor plate. The housing and gaskets must mount on the floor plate to form a weath¬erproof junction box Door holders must be listed to UL-228.

d. All holders must be normally be energized, and a release must be accomplished by interrupting the circuit.
e. The electromagnetic door holders must be Edwards 1500 series. No substitutions permitted.

2. Surge Suppression Devices.
   a. The system must utilize the following electrical surge protection devices to prevent damage and nuisance alarms caused by nearby lightning strikes, stray currents, or voltage transients.
   b. On the AC Input of all fire alarm panels, remote power supplies and HPSA sites. Subject to compliance with requirements, provide one of the following:
      1) Transtector ACO100BWN3.
      2) Leviton OEM-120EFI, EFI HWM-120.
      3) Ditek DTK-120HW.
      4) DTK-120/240 CM.
      5) Or approved equal.
   c. AC Surge protectors must be installed at the electrical panel board feeding the fire alarm equipment. Excess lead length must be trimmed. The branch circuit conductor must be formed into a 5-10 turn 1” diameter tie-wrapped coil just downstream of the suppressor connection.
   d. On each DC fire alarm circuit entering or leaving the building. Subject to compliance with requirements, provide one of the following:
      1) Transtector TSP8601.
      2) Citel American B280 -24V.
      3) Edco P264 and P64.,
      4) Ditek DTKxLVL series.
      5) Or approved equal.
   e. DC Surge protectors must be installed on each required circuit at the point of entry into the building.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. General
   1. The entire system must be installed in a skillful manner in accordance with approved manufacturer’s installation manuals, shop drawings and wiring diagrams.
   2. All work must be performed in accordance with the requirements of NFPA 70 and NFPA 72.
   3. Coordinate locations of all devices with all other divisions’ drawings and specifications.
   4. All fire alarm devices must be accessible for periodic maintenance. Should a device location indicated on the contract drawings not meet this requirement, it must be the responsibility of the contractor to bring it, in writing, to the attention of the Commissioner.

5. Fasten equipment to structural members of building or metal supports attached to structure, or to concrete surfaces.

6. All systems and system components listed to UL864 Control Units for Fire Protective Signaling Systems may be installed within a common conduit raceway system, in accordance with the manufacture's recommendations. System(s) or system components not listed to the UL864 standard must utilize a separate conduit raceway system for each of the sub-systems.

7. No wiring except life safety system circuits and system power supply circuits must be permitted in the control panel enclosures.

8. Any low-voltage copper wiring that leaves the protection of a building must be provided with a compatible UL 497B listed transient protection devices where the circuit leaves the building and where it enters the next building.

9. Devices containing end-of-line resistors must be appropriately labeled. Devices should be labeled such that removal of the device is not required to identify the EOL device.

10. Fiber Optic Cable:
    a. Only glass filament cable permitted. Plastic filament fiber optic cables are not acceptable.
    b. ST connectors must be used at all equipment terminations.

11. All penetration of floor slabs and fire walls must be fire stopped in accordance with 2022 NYC Building Code.

12. All wiring must be color coded throughout, to NYC Electrical Code standards.

13. The system must be arranged to receive power from one three wire 120 Vac, 15 A supply. All low voltage operations must be provided from the fire alarm control panel.

14. Wiring
    a. Rigid conduit – THHN as per NYC approved.
    b. EMT with Teflon – 150 C – fire alarm wiring – NYC approved.
    c. Horn circuits 3#12
    d. Strobes 2 #14
    e. All other addressable loop wires #16 AWG.

15. Fire Alarm Fused Disconnect Power Supply (Fuse Cut-Out)
    a. Must exceed 10 feet tap length from the service switch and connected on the line side.

B. Electrical

1. Boxes, Enclosures and Wiring Devices:
    a. Boxes must be installed plumb and firmly in position.
    b. Extension rings with blank covers must be installed on junction boxes where required.
    c. Junction boxes served by concealed conduit must be flush mounted.
    d. Fire alarm system junction box covers must be painted red.
    e. Wiring within cabinets, enclosures, boxes, junction boxes and fittings must be installed in a neat and workmanlike manner, installed parallel with or at right angles to the sides and back of any box, enclosure or cabinet, and routed to allow

access for maintenance. All conductors that are terminated, spliced, or otherwise interrupted in any enclosure, cabinet, mounting or junction box must be connected to terminal blocks. Mark each terminal in accordance with the wiring diagrams of the system. Make all connections with approved pressure type terminal blocks, which are securely mounted. All terminal block screws must have pressure wire connectors of the self-lifting or box lug type. No more than two conductors must be installed under one connection. Wire nuts, crimp splices and similar devices must not be used.

2. Conductor:
   a. Each conductor must be identified as shown on the drawings at terminal points. Permanent wire markers must be located within 2 inches of the wire termination. Marker text must be visible with protective doors or covers removed.
   b. Maintain a consistent color code for fire alarm system conductor functions throughout the installation.
   c. All wiring must be installed in compliance with the National Electric Code, NFPA 70, and the equipment manufacturer's requirements.
      1) Wiring for Signaling Line Circuit and Initiating Device Circuit field wiring must be solid copper, No. 18 AWG twisted pair conductors at a minimum. Speaker circuits; 16 AWG twisted pair at a minimum. Telephone circuits must be 18 AWG twisted-shielded pair at a minimum. 24VDC visual and audible Notification Appliance Circuits must be solid copper No. 14 AWG size conductors at a minimum. The wiring sizes listed herein are minimum sizes. Use larger wire sizes when recommended by the manufacturer, based on system configuration and project specific calculations.
      2) Where shielded wiring is used, the shield must be grounded at only one point, which must be in or adjacent to the FACP or other control equipment. Shields must be continuous, treated as a third conductor, and insulated from ground except as noted.
      3) T-taps (branches) are permitted in Style 4 SLC circuits with interconnections occurring on terminal strips.
      4) Circuits to third-party systems (HVAC, Elevators, fire pumps, etc.) must terminate in terminal cabinets within three (3) feet of the controllers for those systems.
      5) AC power wiring must be No. 12 AWG solid copper having insulation rated for 600 volts.
      6) Crimp type spade lugs must be used for terminations of stranded conductors to binder screws or stud type terminals.
   d. All wiring must be checked and tested to ensure that there are no grounds, opens or shorts.
3. Devices:
   a. All devices and appliances must be mounted to or in an approved electrical box.
4. Raceways:
   a. Conduits must be sized according to the conductors contained therein. Cross sectional area percentage fill for system conduits must not exceed 40%.
   b. Install all conductors in rigid metal conduit or electro-metallic tubing, utilizing compression type fittings and couplings, with a minimum diameter 3/4". The use of flexible metal conduit not exceeding a six (6) foot length must be permitted for initiating device circuits.

c. All fire alarm conduit systems must be routed and installed to minimize the potential for physical, mechanical or fire damage, and must not to interfere with existing building systems, facilities or equipment.
d. Run conduit or tubing concealed in finished areas unless specifically shown otherwise on the drawings. Conduit may be exposed in unfinished mechanical/electrical rooms, and basement levels.
e. All system conduits, junction boxes, pull boxes, terminal cabinets, electrical enclosures and device back box locations must be readily accessible for inspection, testing, service and maintenance.

5. Open Cable:
   a. Power Limited cable, when not installed in UL listed metal conduit or raceway, must be mechanically protected by building construction features par NFPA 70, Article 760.
      1) Installation must be in areas not subjected to mechanical injury.
      2) All circuits must be supported by the building structure. Cable must be attached by straps or bridal rings to the building structure at intervals not greater than 10 feet. The use of staples is prohibited. Fire alarm wiring must not be bundled or strapped to existing conduit, pipe or wire in the facility.
      3) Where wiring is installed above drop ceilings, cable must not be laid on ceiling tiles.
      4) Cable must not be fastened in a manner that puts tension on the cable.
   b. Power Limited Cable must be FPLP, FPLR or FPL, or as approved by Commissioner.

C. Fire Alarm Components
1. Devices:
   a. All devices and appliances must be mounted to or in an approved electrical box.
   b. All wall mounted control equipment must comply with requirements defined by the International Building Code and Acceptance Criteria for Seismic Qualification by Shake-Table Testing of Nonstructural Components and Systems (AC-156) using a seismic component importance factor of 1.5.
2. Fire Alarm Control Panels:
   a. Mount the enclosure with the top of the cabinet 72” above the finished floor or center the cabinet at 63”, whichever is lower.
   b. Label the fire alarm panels with the room number, electrical panel number and circuit breaker number feeding them.
   c. Paint the handles of the dedicated circuit breakers feeding fire alarm panels red, and install handle locks.
   d. Within the panel, all non-power limited wiring must be properly separated from power limited circuits.
   e. Grounds must comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.
3. Remote Annunciator:
   a. Mount the panel; with the top of the panel 72” above the finished floor or center the panel at 63”, whichever is lower.
4. Manual Pull Stations:

a. Mount stations so that their operating handles are between 42” and 48” above the finished floor.

5. Notification Appliances: Mount assembles as follows:
   a. All wall mounted audio/visual devices must be mounted so the entire lens is between 80” and 96” above the finished floor. Where low ceilings exist, devices must be mounted within 6” of the ceiling.
   b. Each speaker’s (horn) output must be set to the wattage value indicated for its specific location as shown on the drawings.
   c. Each strobe’s output must be set to the candela value indicated for its specific location as shown on the drawings.
   d. Each speaker (horn)-strobe’s outputs must be set to the wattage/candela value indicated for its specific location as shown on the drawings.
   e. Where ceiling height exceeds 30 feet, ap¬pliances must be suspended from the ceiling to a height of 30 feet maximum above the finished floor.
   f. Appliances installed outdoors must be UL listed for outdoor use.
6. Smoke Detectors:
   a. Smoke and heat detector heads must not be installed until after construction clean-up is completed. Detector heads installed prior to construction clean-up must be cleaned by the manufacturer or replaced.
   b. Detectors located on the wall must have the top of the detector at least 4" and not more than 12” below the ceiling.
   c. On smooth ceilings, detectors must not be installed over 30 ft. apart in any direction.
   d. Install smoke detectors no closer than 3 ft. from air handling supply air diffusers or return air openings.
   e. Locate detectors no closer than 12” from any part of a lighting fixture.
7. Duct Detectors:
   a. Install sampling tubes so they extend the full width of ducts exceeding 36”.
   b. Detectors must be located to facilitate ease of maintenance.
   c. All penetrations near detectors located on/in return ducts must be sealed to prevent air entry.
8. Heat Detectors:
   a. Heat detectors must be installed in strict accordance with their UL listing and the requirements of NFPA 72.
   b. Heat detectors installed in the elevator machinery room to meet ANSI A17.1 requirements for elevator power disconnect, must be located adjacent to each sprinkler head. Coordinate temperature rating and location with sprinkler rating and location.
9. End of Line Resistors:
   a. Devices containing end-of-line resistors must be appropriately labeled.
10. Addressable Control (Relay) Modules:
   a. Install the module less than 3 feet from the device controlled.
   b. Orient the device mounting for best maintenance access.
   c. Label all addressable control modules as to their function.
   d. Provide a dedicated 24VDC circuit to feed all auxiliary relays required for inductive loads (auxiliary relays, door holders). Circuits must be supervised via an

end-of-line relay and addressable input module. Auxiliary relays must not derive their power from the starter or load being controlled.

11. Remote Status and Alarm Indicators:

    a. Install near each smoke detector and each sprinkler water-flow switch and valve-tamper switch that is not readily visible from normal viewing position.

3.3 FIELD QUALITY CONTROL

A. The system must be installed and fully tested under the supervision of a trained manufacturer's representative. The system must be demonstrated to perform all of the function as specified.

3.4 TESTS

A. Reports of any field-testing during installation must be forwarded to the Commissioner.

B. Each individual system operation on a circuit-by-circuit basis must be tested for its complete operation. The procedure for testing the entire fire alarm system must be set forth with the consent of the code enforcement official, the Commissioner and the manufacturer.

3.5 DOCUMENTATION AND INSTRUCTION

A. The contractor must compile and provide to the City of New York three (3) complete manual on the completed system to include operating and maintenance instruction, catalog cuts of all equipment and components, as-built wiring diagrams, system program on disk (CD) and a manufacturer's suggested spare parts list.

B. In addition to the above manuals, the contractor must provide the services of the manufacturer's trained representative for a period of four (4) hours to instruct the City of New York’s staff on the operation and maintenance of the entire system. An EST-4 End-User Instruction Video must be included as part of the system documentation.

END OF SECTION 28 46 20

SECTION 31 20 00 – EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Earthwork for building construction, utilities and site work.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of the following manufactured products required:

1. Geotextiles.
2. Warning tapes.

B. Samples for Verification: For the following products, in sizes indicated below:

1. Geotextile: 12 by 12 inches.
2. Warning Tape: 12 inches long; of each color.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Codes and Standards: Perform excavation work in compliance with the current New York City Building Code requirements.

C. Testing and Inspection Service: Retain a soil testing and inspection service, acceptable to the Commissioner for quality control testing during earthwork.

D. Special Inspection: City of New York State will retain a Special Inspector to perform Special Inspections required by Code. The Contractor will cooperate with and facilitate the activities of the testing agency and Special Inspector.

E. Follow EPA's Best Management Practices for erosion and sedimentation control.

1.6 FIELD CONDITIONS

A. Work Schedule: Prior to any excavation operations, submit for review the intended excavation procedure completely describing in detail the methods, equipment and procedures to be used.

1. Review of the Contractor's methods will in no way relieve the Contractor of responsibility for the successful performance of all methods and protection of adjoining property. The responsibility for all claims, cost and damages that arise as a result of this work will be borne by the Contractor at no cost to the City of New York.
2. Conduct the exit of trucks containing excavated materials so that there is no spillage from the trucks and also hose down tires prior to entry onto the city streets, so as not to track material thereon. Provide dust control as required.

B. Earthwork will be performed in compliance with the applicable requirements of all laws, codes, ordinances and regulations of New York State and New York City Department of Buildings over this work and OSHA.

1. Provide for the protection of persons and property in accordance with the applicable requirements of the Code and ANSI A10.2, Part 2, "Excavation Work" of the "American Standard Code for Building Construction", including sections relative to protection of the public; sheet piling, shoring and bracing; trenches and excavating equipment.

C. Existing Utilities: Locate existing underground utilities in and adjacent to areas of work. Provide support and protection of utilities to remain in accordance with utility owner's requirements.

1. Do not interrupt existing utilities except when permitted in writing and then only after acceptable temporary utility services have been provided.
2. Provide minimum of 48-hour notice to the Commissioner, to the utility companies and New York City Building Department, and receive written notice to proceed before interrupting any utility.
3. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult Utility Owner immediately for directions. Cooperate with Commissioner and Utility Owner in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of Utility Owner.

D. Use of Explosives: The use of explosives is not permitted.

E. Protection of Persons and Property: Barricade excavations and post with warning lights, as required by New York City Department of Buildings.

1. Protect structures, utilities and pavements from settlement, movement, undermining, washout and other hazards of earthwork.

F. Shoring, Bracing, Underpinning and Protection: Support adjoining properties to prevent injury to persons and property.

1. Provide stabilization construction including: sheeting, shoring, bracing, underpinning and other construction as required by job conditions and the current New York City Building Code. Refer to contract documents for temporary support of excavation.

G. Documentation and Monitoring: Conduct an initial detailed pre-construction condition survey to assess the existing conditions of adjacent structures within 50 ft. radius of the proposed work to provide a quantifiable baseline prior to construction.

1. Document the condition of existing adjoining buildings by means of dated photographs prior to beginning work. If possible, document both interior and exterior conditions. Continue to monitor conditions with dated photographs throughout the construction period and upon completion of construction. Print photographs and retain in a binder.
2. Install tell-tales, crack gages, and/or survey points at applicable locations, and base values recorded. Take readings of installed instrumentation frequently during active operations and on regular intervals until the new construction exceeds the height of the existing structures.
3. Submit a written report of any observed changes in the conditions during the construction period.

H. Obstructions: The Contractor will remove all existing foundations and other obstructions as required to accommodate new construction.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Satisfactory Soils: Gravel and sand materials complying with ASTM D 2487 - Classification of Soils for Engineering Purposes, for soil classification Groups GW, GP, GM, SM, SW and SP.

B. Unsatisfactory Soils: Clayey gravel or sand, clay, silt and peat materials complying with ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH and PT.

C. Subbase Material, general: Natural or artificially graded mixture of natural or crushed gravel, crushed stone, natural or crushed sand. Provide graduation of materials as indicated in the Geotechnical Report appended to and incorporated by reference to this Specification.

D. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100% passing a 1-1/2-inch sieve and not more than 5% passing a No. 4 sieve.

E. Backfill and Fill Materials: Satisfactory soil materials free of clay, silt, peat, rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter, and free from contamination and hazardous materials.

F. Limitations for use of on-site materials.

1. Do not use on-site materials for any structural uses.
2. On-site materials may be used for fill under the 2" protection slabs at crawl spaces.
3. On-site materials used below the cellar slabs will be reprocessed.

4. Onsite materials used outside the footprint of the building (planted areas, sidewalks, etc.) will be carefully picked over to remove all materials 4" or greater in any dimension.

2.2 GEOTEXTILES

A. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 2; AASHTO M 288.
2. Survivability: As follows:

a. Grab Tensile Strength: 247 lbf; ASTM D4632.
b. Sewn Seam Strength: 222 lbf; ASTM D4632.
c. Tear Strength: 90 lbf; ASTM D4533.
d. Puncture Strength: 90 lbf; ASTM D4833.
e. Apparent Opening Size: No. 60 sieve, maximum; ASTM D4751.
f. Permittivity: 0.02 per second, minimum; ASTM D4491.
g. UV Stability: 50 percent after 500 hours' exposure; ASTM D4355.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXCAVATION

A. Unclassified Excavation: Excavation is Unclassified, and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered. Excavation includes removal of all existing work, including all foundation walls, rubble, brick, concrete, rubbish, earth and rock and all other materials and obstructions encountered.

B. Unauthorized Excavation: The removal of materials beyond indicated subgrade elevations without authorization. Unauthorized excavation and remedial work, will be at Contractor's expense.

C. Stability of Excavations: Slope sides of excavations to comply with New York City Building Code and ordinances. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain excavations in a safe condition.

D. Shoring and Bracing: Provide and maintain shoring and bracing in a serviceable condition, to comply with contract requirements and New York City Department of Buildings requirements.

E. Dewatering: Prevent water from any source, including ground water, from flowing into excavations and from causing flooding. Provide pumps as necessary for dewatering. Take

precautions not to destabilize adjoining foundations or subsurface construction by dewatering operations. Discharge water off site in accordance with requirements of New York City DEP.

1. Coordinate dewatering with all trades.

F. Excavation for Structures: Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 inch. Excavate to permit concrete formwork, installation of services, and for inspection.

1. Completely remove fill from under footings. If sand is not encountered at the proposed footing levels, then over-excavate the subgrade and bring back to grade with controlled compacted fill. Controlled compacted fill may include Granular Fill or Sand-Gravel Fill.

G. Excavation for Pavements: Cut surface under pavements to comply with cross-sections, elevations and grades as shown.

H. Excavation for Trenches: Dig trenches to provide ample working room. Provide 6 to 9 inches clearance on both sides of pipe or conduit.

1. Excavate trenches to depth required for mechanical and electrical Work and for their subbase.
2. Backfill trenches with concrete where trench passes below and within 18 inches of column or wall footings, up to bottom of footing.
3. Backfill trenches after tests and inspections, and backfilling are authorized. Avoid damage or displacement of pipe and conduit.

I. Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 35 deg F.

J. Other Excavation Requirements:

1. Where the footing subgrade is dry, excavate to final depth with a smooth-edged shovel, remove any disturbed material and densify/proof-roll the exposed bearing subgrade with a minimum of four passes of a vibratory walk behind double drum roller.
2. Protect prepared footing subgrades against frost. Do not place fill over frozen soil. Over excavate disturbed subgrades to firm and stable ground and replaced by compacted crushed stone (wrapped in filter fabric), sand-gravel fill, or lean concrete (f'c 2000psi).
3. Backfill excavations as soon as practical to reduce exposures to weather elements and/or construction traffic.

3.3 BACKFILL AND FILL

A. General: Place fills in layers to required subgrades, as follows:

1. In Excavations: Satisfactory excavated or borrow material.
2. Under Pavements: Subbase material, general.
3. Under Building Slabs: Sub-base material.
4. Under Piping and Conduit: Subbase material.

B. Backfill: Backfill excavations as promptly as work permits, but not until completion of the following:

1. Inspection and acceptance of construction below finish grade.
2. Inspection, testing, approval and recording of utilities.
3. Removal of concrete formwork, shoring and bracing.
4. Removal of trash and debris.
5. Horizontal bracing for horizontally supported walls.

C. Surface Preparation: Remove vegetation, debris, unsatisfactory soils, obstructions and deleterious materials prior to placement of fills.

1. When existing ground surface has a density less than specified under "Compaction", break up surface, moisten to optimum moisture content, and compact to required depth and density.
2. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.

D. Placement and Compaction: Place backfill and fill in layers not more than 8 inches in loose depth where compacted by heavy equipment, and not more than 4 inches in loose depth where compacted by hand tampers.

1. Before compaction, moisten or aerate each layer to optimum moisture content. Compact each layer to required density. Do not place backfill or fill on ground that is muddy, or contains frost.
2. Place backfill and fill materials evenly adjacent to structures, piping or conduit, to prevent wedging of backfill against structures or displacement of piping or conduit.

3.4 GRADING

A. General: Uniformly grade areas within specified tolerances, with uniform levels or slopes between indicated elevations and existing grades.

B. Grading: Grade areas to drain and to prevent ponding, within 1/2 inch of required elevation.

C. Compaction: After grading, compact subgrades to the depth and density required for each area classification.

3.5 BUILDING SLAB DRAINAGE COURSE

A. General: Drainage course consists of drainage fill of indicated thickness over subgrade surface.

B. Placing: Place drainage fill on prepared subgrade in uniform layers. Maintain optimum moisture content during placement.

1. Place drainage course up to 6 inches thick in a single layer. When more than 6 inches thick, place material in equal layers, between 6 inches and 3 inches in thickness when compacted.

3.6 COMPACTION

A. Maximum Density Requirements: Compact soil to not less than the following percentages of maximum density in accordance with ASTM D 1557.

1. Structures, Building Slabs, Pavements: Compact top 12 inches of subgrade and each layer of fill at 95 percent maximum density.
2. Unpaved Areas: Compact top 6 inches of subgrade and each layer of fill at 90 percent maximum density.
3. Walkways: Compact top 6 inches of subgrade and each layer of fill at 95 percent maximum density.

B. Moisture Control: Where subgrade or soil must be moistened before compaction, uniformly apply water to avoid free water on surface.

1. Remove and replace, or scarify and air dry, soil that is too wet for compaction to specified density.
2. Soil that is too wet for compaction may be spread and allowed to dry to a satisfactory value.

3.7 FIELD QUALITY CONTROL

A. Inspections: Allow testing service and Special Inspection Agent to inspect and approve subgrades and fill layers before further construction work is performed.

1. Tests: Field density test will comply with ASTM D 1556 (sand cone method) or ASTM D 2167 (rubber balloon method), as applicable.
2. Footing Subgrade: For each strata of soil on which footings will be placed, perform at least one test or inspection to verify required design bearing capacities.
3. Building Slab Subgrade: One field density test of subgrade will required for every 2000 sq. ft. of building slab, but not less than 3 tests. In compacted fill, one field density test will be required for every 2000 sq. ft. of building slab, but not less than 3 tests.

B. Correction: If, in the opinion of the Special Inspection Agent, reports and inspection show subgrade or fills below specified density, provide additional compaction and testing at no additional expense to the City of New York.

3.8 DISPOSAL OF MATERIALS

A. Remove excess and unacceptable excavated material, trash, debris and waste materials and legally dispose of them off the City's property.

END OF SECTION 31 20 00

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 31 50 00 – EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

A. Section Includes:

1. Shoring and underpinning
2. Concrete piers and walls
3. Drilled soldier piles and timber lagging
4. Fill and backfill
5. Restoration

B. Related Sections:

1. Section 0711 13 “Bituminous Damproofing”
2. Section 03 30 00 “Cast-in-Place Concrete” for cast-in-place concrete requirements

C. Cited Standards:

1. American Concrete Institute (ACI)
   a. ACI 305 and 306: Guides to Hot and Cold Weather Concreting

2. ASTM International (ASTM)
   a. ASTM D245: Standard Practice for Establishing Structural Grades and Related Allowable Properties for Visually Graded Lumber
   b. ASTM D4832: Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders
   c. ASTM A36 - Standard Specification for Carbon Structural Steel
   d. ASTM A572: Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
   e. ASTM A615: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

3. American Welding Society (AWS)
   a. AWS D1.1: Steel Structural Welding

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTAL PROCEDURES

A. Prepare and submit the submittals to the Commissioner for review and approval.

1. Excavation and Underpinning Program: Prepare and submit a written schedule and procedure, along with detailed drawings, of the drilled soldier pile installation, excavations, shoring, and underpinning work. Procedures must include detection of movement, as specified in Article 3.2 herein, and preloading (jacking load) of underpinning.

2. Shop Drawings: Submit Shop Drawings, indicating method, staging, and necessary details for construction of underpinning, jacking procedure and sequence, type of jack, and installation of drilled soldier piles. Shop Drawings and calculations must be prepared, sealed, and signed by a professional geotechnical engineer currently licensed in the State of New York. All welding and steel fabrication must conform to requirements of the related Section.

3. Calculations: Submit design analyses and calculations to support Shop Drawings.

4. Jacking Gage Calibration: Submit data for the pressure gage and jack combinations certified by an accepted testing laboratory not earlier than 14 days prior to start of use for underpinning.

5. Restoration: Submit procedures, methods, and materials lists for restoration of structures and facilities.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Installer with Special Experience:

1. Installer Qualifications: An entity meeting the requirements of DDC General Conditions Section 014000 1.7/C1.

C. Regulatory requirements that govern the work of this Section include the following codes:

1. Code of Federal Regulations (CFR) 29 Occupational Safety and Health Administration (OSHA) Part 1926 - Excavations

2. New York City Building Code (NYCBC) 2022

1.6 SITE CONDITIONS

A. Notify the Commissioner at least 30 days in advance of the date on which the Contractor requires occupancy of parcels to be underpinned, supported, excavated and restored.

B. Staging and Working Space: Working areas for underpinning, pile installation and excavation support are shown on the Contract Drawings. If additional working areas beyond those obtained are necessary, obtain use of such areas at no additional expense to the City of New York.

C. Temporary Partitions: Where indicated or required, build closed temporary partitions of suitable materials to isolate the work site from the portions of the structure not occupied by the Contractor.

D. Maintenance of Services: Locate, protect, support, and maintain all utilities, equipment, and services, within the limits of the excavation work, or relocate same as indicated or required. Proceed with caution in areas of utility facilities and structures. Expose existing utilities by hand excavation or by other method acceptable to the City of New York.

PART 2 - PRODUCTS

2.1 PRODUCT REQUIREMENTS

A. The Contractor must furnish all materials, tools, equipment, facilities, and services as required for providing the necessary excavation support, underpinning, drilled solider pile installation and shoring work.

2.2 MATERIALS AND EQUIPMENT

A. Concrete/Grout:

1. Concrete: Concrete for underpinning piers must be a stable cementitious base mix, with a maximum water-cement ratio of 0.45 by weight with a minimum 28-day compressive strength of 4,000-psi or as indicated on the Contract Drawings. Approved additives to be mixed as approved by the Commissioner.

2. Grout: Cement grout for grouting piles must be a stable cementitious base mix, with a maximum water-cement ratio of 0.45 by weight with a minimum 28-day compressive strength of 4,000-psi or as indicated on the Contract Drawings. Approved additives to be mixed as approved by the Commissioner.

3. Drypack: Drypack must consist of 50 percent sand and 50 percent Type II Portland Cement mix that is moist enough to roll a ball by hand yet yields no water when squeezed.

4. Controlled Low Strength Material (CLSM): CLSM/flowable fill is to be used for backfilling between foundation wall and excavation support elements, between footings and below foundation slabs. CLSM/flowable fill must have a minimum a minimum 28-day compressive strength between 100-psi and 150-psi or as indicated on the Contract Drawings.

5. Concrete, grout and CLSM placed must be thoroughly compacted during placement by vibrating, spudding or rodding.

B. Steel:

1. Reinforcing: All steel reinforcing must conform to ASTM A615 (Grade 60)

2. Drilled Soldier Piles: Provide drilled piles as indicated on the Contract Drawings. Steel casing must conform to ASTM A572 (Grade 50). Provide appropriate coupon samples are tested and provided to the Commissioner.

3. Plates: All steel for plates, edges and shims must conform to ASTM A36 (Grade 36).

4. Bolts:

   a. Anchors in concrete: Subject to compliance with requirements, provide one of the following:
      1) "Hilti"; KWIK Bolt 3 Carbon Steel Expansion Anchors
      2) "DEWALT"; Power-Stud+SD1
      3) "SIMPSON"; Strong-Bolt 2 Wedge Anchor
      4) Or Approved Equal.

   b. Anchors in masonry: Subject to compliance with requirements, provide one of the following:
      1) "Hilti" HIT-HY 270 anchors
      2) "DEWALT" AC100+Gold
      3) "ITW "; A7+
      4) Or Approved Equal.

C. Timber: Provide heavy timber boards, planking, sheathing, and/or accessories as required. All timber for lagging must be construction grade with a minimum allowable bending stress of 1800-psi and shear stress of 175-psi. Nails, spikes and bolts to be sized as required and have the strength and character to maintain timber in place during excavation and concreting for underpinning.

D. Jacking Equipment: Jacks and jacking equipment must be more than adequate for the imposed loads and must be provided with calibrated gages.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

A. Consult the records of adjacent structures and of existing utilities and their connections. Perform a field condition survey on all affected structures and document actual dimensions and existing physical conditions. Notify the Commissioner immediately if interference is found. Work must proceed with caution in areas of known utility facilities.

B. Protect, as required, all public and private properties adjacent to the work. Make repairs at contractor's own expense to damaged property necessitated by reasons of, or occurring in the course of, operations under this Contract, to the complete satisfaction of the Commissioner, and the property owner of the damaged property.

C. Where design parameters and requirements for specific excavation support systems are shown on the Contract Drawings, Contractor is responsible for verifying the applicability of the design assumptions noted thereon. If actual conditions differ from the stated design assumptions, these conditions must be documented, and the design parameters used to be modified accordingly.

D. Contractor is solely responsible for the safety, stability and integrity of all structures affected by the work. The excavation and support protection work must be performed in the presence of a New York City special inspector as described in Article 3.8 herein.

E. Obtain all necessary permits for excavation support and protection.

3.3 DETECTION OF MOVEMENT

A. Perform survey and monitoring in accordance with Contract Drawings.

B. Install crack gauges on existing building cracks as required to monitor during performance of the work.

C. Install settlement monitoring points on existing adjacent structure(s) and ground surfaces as indicated on the Contract Drawings. Settlement points must be capable of being read to an accuracy of 0.005 foot.

D. Install vibration monitors (seismographs) adjacent to areas where work is being performed as shown on the Contract Drawings. Vibration monitors must take real-time readings.

E. Perform survey and monitoring in accordance with the Contract Drawings. The detection of movement must be performed by a qualified licensed land surveyor or engineer licensed in the State of New York.

F. Stop work, notify the Commissioner and take immediate remedial action if movement of the existing structure exceeds limiting criteria, as indicated on the Contract Drawings, during performance of the work.

3.4 SHORING AND UNDERPINNING

A. Install concrete underpinning piers at locations and extended to elevations as shown on the Contract Drawings. Provide timber sheeting pits, as required, to provide for underpinning pier installation.

B. Perform underpinning jacking at the locations and as per the procedures outlined in the Contract Drawings.

3.5 DRILLED SOLDIER PILES AND LAGGING

A. Install drilled soldier piles at locations and extended to elevations as shown on the Contract Drawings. Provide timber lagging, as required, to hold back earth at excavations.

B. Maximum out-of-plumb tolerance for installed piles is two percent.

C. Maximum offset of top of pile from the design center is three inches.

3.6 FILL AND BACKFILL

A. Provide CLSM/flowable fill for backfilling between foundation wall and excavation support elements, between footings and below foundation slabs, in accordance with the Contract Drawings.

3.7 RESTORATION

A. Restore existing structures to conditions equivalent to those existing prior to the start of excavation support and underpinning work, including repair of any settlement-related damage.

3.8 QUALITY CONTROL TESTS AND INSPECTIONS

A. Special Inspections: The City of New York will engage a qualified special inspector to perform the following inspections in accordance with the NYCBC 2022.

1. Excavation-Sheeting, Shoring and Bracing (NYCBC 1705.25.3 and 3304.4.1)

2. Underpinning (NYCBC 1705.25.4 and 1817)

3. Subgrade Inspection (NYCBC 1705.6.4)

B. Concrete/Grout/CLSM Testing:

1. Engage and pay for an independent commercial testing laboratory approved by the Commissioner to test concrete, grout and CLSM placed. One set of six test cylinders must be taken for every 100 cubic yards or less of each type of material placed daily.

2. One cylinder must be compressive strength tested at three days, one cylinder at seven days and two cylinders at 28 days.

3. Cylinder test reports are to be submitted to the Commissioner the next day after testing is completed.

END OF SECTION 31 50 00

SECTION 32 01 90.33 – TREE AND SHRUB PRESERVATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. General protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

1.3 DEFINITIONS

A. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.

B. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:

1. Include plans, elevations, sections, and locations of protection-zone fencing and signage, showing relation of equipment-movement routes and material storage locations with protection zones.

C. Samples: For each type of the following:

1. Organic Mulch: Sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch.
2. Protection-Zone Fencing: Assembled Samples.
3. Protection-Zone Signage: Full-size Samples.

D. Tree Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.

1.7 INFORMATIONAL SUBMITTALS

A. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

B. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

C. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Arborist Qualifications: Certified Arborist as certified by ISA, licensed arborist in the State of New York, current member of ASCA, or registered Consulting Arborist as designated by ASCA.

1.9 FIELD CONDITIONS

A. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Moving or parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

B. Do not direct vehicle or equipment exhaust toward protection zones.

C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Backfill Soil: Planting soil of suitable moisture content and granular texture for placing around tree; free of stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.

B. Organic Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, consisting of one of the following:

1. Type: Ground or shredded bark.

C. Protection-Zone Fencing: Fencing fixed in position and meeting one of the following requirements:

1. Plastic Protection-Zone Fencing: Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch maximum opening in pattern and supported by tubular or T-shape galvanized-steel posts spaced not more than 96 inches apart. High-visibility orange color.

a. Height: 48 inches.

D. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes prepunched and reinforced; legibly printed with nonfading lettering.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

3.3 PREPARATION

A. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

B. Tree-Protection Zones: Mulch areas inside tree-protection zones and other areas indicated. Do not exceed indicated thickness of mulch.

1. Apply 4-inch uniform thickness of organic mulch unless otherwise indicated. Do not place mulch within 6 inches of tree trunks.

C. Trunk Protection: Protect the trunk of each tree to remain as follows:

1. Wrap trunk with orange plastic construction fencing to 2 inches in thickness. Install 2-by-4-inch wood planks around trunk over wrap at maximum 3 inches apart. Minimum three planks per tree. Band together with no less than three steel bands stapled to the planks to hold them securely in place.

   a. Height: 48 inches.

2. Trunk protection to remain in place no longer than 12 months. If construction exceeds timeframe indicated, inspect trunk protection at 6-month intervals and loosen if necessary.

3.4 PROTECTION ZONES

A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones in a manner that will prevent people from easily entering protected areas except by entrance gates.

B. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Commissioner.

C. Maintain protection zones free of weeds and trash.

D. Maintain protection-zone fencing and signage in good condition as acceptable to Commissioner and remove when construction operations are complete and equipment has been removed from the site.

3.5 EXCAVATION

A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Section 312000 "Earth Moving" unless otherwise indicated.

B. Trenching within Protection Zones: Where utility trenches are required within protection zones, excavate under or around tree roots by hand or with air spade, or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning.

C. Do not allow exposed roots to dry out before placing permanent backfill.

3.6 ROOT PRUNING

A. Prune tree roots that are affected by temporary and permanent construction. Prune roots as shown on Drawings and as follows:

1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
2. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
3. Cover exposed roots with burlap and water regularly.
4. Backfill as soon as possible according to requirements in Section 312000 "Earth Moving."

B. Root Pruning at Edge of Protection Zone: Prune tree roots by cleanly cutting all roots to the depth of the required excavation.

C. Root Pruning within Protection Zone: Clear and excavate by hand or with air spade to the depth of the required excavation to minimize damage to tree root systems. If excavating by hand, use narrow-tine spading forks to comb soil to expose roots. Cleanly cut roots as close to excavation as possible.

3.7 CROWN PRUNING

A. Prune branches that are affected by temporary and permanent construction. Prune branches as directed by arborist.

1. Prune to remove only injured, broken, dying, or dead branches unless otherwise indicated. Do not prune for shape unless otherwise indicated.
2. Do not remove or reduce living branches to compensate for root loss caused by damaging or cutting root system.
3. Pruning Standards: Prune trees according to ANSI A300 (Part 1) and as indicated on Drawings.

B. Cut branches with sharp pruning instruments; do not break or chop.

C. Do not paint or apply sealants to wounds.

D. Chip removed branches and dispose of off-site.

3.8 REGRADING

A. Lowering Grade: Where new finish grade is indicated below existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

B. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

C. Minor Fill within Protection Zone: Where existing grade is 2 inches or less below elevation of finish grade, fill with backfill soil. Place backfill soil in a single uncompacted layer and hand grade to required finish elevations.

3.9 FIELD QUALITY CONTROL

A. Inspections: Engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

3.10 REPAIR AND REPLACEMENT

A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or to be relocated that are damaged by construction operations, in a manner approved by Commissioner.

1. Perform repairs of damaged trunks, branches, and roots within 24 hours according to arborist's written instructions.
2. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Commissioner.

B. Excess Mulch: Rake mulched area within protection zones, being careful not to injure roots. Rake to loosen and remove mulch that exceeds a 4-inch uniform thickness to remain.

3.11 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove excess excavated material, displaced trees, trash, and debris and legally dispose of them off City's property.

END OF SECTION 32 01 90.33

SECTION 32 05 13 – SOILS FOR EXTERIOR IMPROVEMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Work of this Section includes, but is not limited to the following:

1. Analysis of existing soils.
2. Evaluation of rough subgrade water infiltration.
3. Planting soil material acquisition.
4. Testing and analysis for specification conformance.
5. Inspection and testing of subgrade for preparation of subgrade.
6. Preparation of mixes and testing for conformance.
7. Installation and placement of soils.
8. Decompaction of soils.
9. Final in-place testing of soils.
10. Coordination with other trades.
11. Clean-up.

1.3 REFERENCES

A. ASA: American Society of Agronomy.

B. ANLA: American Nursery & Landscape Association. (Formerly: AAN – American Association of Nurserymen).

C. ANSI:American National Standards Institute.

D. AOAC: Association of Official Agricultural Chemists.

E. ASTM: American Society for Testing Materials.

F. ISA: International Society of Arboriculture.

1.4 APPLICABLE STANDARDS

A. American National Standards for Tree Care Operations, ANSI A300. American National Standards Institute, 11 West 42nd Street, New York, N.Y. 10036.

B. American Standard for Nursery Stock, ANSI Z60.1. American Nursery and Landscape Association, 1250 Eye Street. NW, Suite 500, Washington, D.C. 20005.

C. Horticultural Standards, American Nursery & Landscape Association.

D. Hortus Third, The Staff of L.H. Bailey Hortorium. 1976. MacMillan Publishing Co., New York.

E. Standardized Plant Names, American Joint Committee on Horticultural Nomenclature, 1942 edition.

F. ASTM: American Society for Testing Materials.

G. ISA: International Society for Testing Materials.

H. All standards must include the latest additions and amendments as of the date of advertisement for bids.

1.5 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Finish Grade: Elevation of finished surface of planting soil.

C. Planting Area: Areas to be planted.

D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.

E. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by lower organic matter and soil organisms.

F. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

G. Topsoil: Native or imported topsoil, manufactured topsoil (Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil), or surface soil modified to become topsoil; mixed with soil amendments.

1.6 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.7 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include recommendations for application and use.
2. Include test data substantiating that products comply with requirements.
3. Include sieve analyses for aggregate materials.
4. Material Certificates: For each type of imported soil and soil amendment and fertilizer before delivery to the site, according to the following:

a. Manufacturer's qualified testing agency's certified analysis of standard products.
b. Analysis of fertilizers, by a qualified testing agency, made according to AAPFCO methods for testing and labeling and according to AAPFCO's SUIP #25.
c. Analysis of nonstandard materials, by a qualified testing agency, made according to SSSA methods, where applicable.

B. Sustainable Design Submittals:

1. Environmental Product Declaration (EPD): For each product.

1.8 INFORMATIONAL SUBMITTALS

A. Qualification Data: For each testing agency.

B. Preconstruction Test Reports: For preconstruction soil analyses specified in "Preconstruction Testing" Article.

C. Field quality-control reports.

1.9 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

B. Sources for Soil Components and Soil Mixes: Submit information identifying sources for all soil components and the firm responsible for mixing of soil mixes.

1. Commissioner must have the right to reject any soil supplier.
2. Soil mix supplier must have a minimum of three years’ experience at supplying custom planting soil mixes.
3. Submit supplier name, address, telephone, email, fax numbers, and contact name.
4. Submit certification that accepted supplier is able to provide sufficient quantities of materials and mixes for the entire project.

1.10 TESTING AND SUBMITTALS

A. Certificates: Provide certificates for any composted materials containing sewage sludge. Approval as EPA Type 1 “exceptional quality” is required. Contractor must submit certification that all soil blend components and all soil blends meet all environmental standards of the State

of New York.

B. Testing for Coarse Sand, Base Loam, Leaf and Yard Waste Compost, Sand and Gravel, Crushed Stone, Plant Bed Soil, and Horticultural Subsoil: Testing is required at the following intervals:

1. Testing of individual blend components: Coarse Sand, Base Loam, and Leaf and Yard Waste Compost. Tests are described in this Section.
2. After test results for components have been accepted, create sample mixes of Plant Bed Soil, Horticultural Subsoil, and perform tests described in this Section.
3. After the test results for Plant Bed Soil, Horticultural Subsoil, have been accepted, and during the placement of these soil blends, test every 100 cubic yards of soil mix delivered to the job site. Testing applies to all soil layers of the planting profile.
4. In-place tests: Compaction tests of Plant Bed Soil, and Horticultural Subsoil in accordance with this Section.

C. Test Reports: Submit certified reports for tests as described in this Section.

1. Analysis testing of excavated soils to determine compatibility with specified soils for amendment and integrated reuse.
2. Mechanical gradation (sieve analysis) must be performed and compared to the USDA Soil Classification System. Percent clay (0.002 mm) must be reported separately in addition to silt (ASTM D-422-63, hydrometer method).
3. The silt and clay content must be determined by a Hydrometer Test of soil passing the #270 sieve.
4. Chemical analysis must be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium Magnesium, Aluminum, Iron, Manganese, Lead, Cation Exchange Capacity, Soluble Salts, acidity (pH) and buffer PH.
5. Tests must be conducted in accordance with Recommended Soil Testing Procedures for the Northeastern United States, Latest Edition. Tests include the following:

    a. Test for soil Organic Matter by loss of weight on ignition, as described in Northeastern Regional Publication No. 493, p. 59.
    b. Test for soil CEC by exchangeable acidity method as described in Midwestern Regional Publication. Latest Publication.
    c. Test for soil Soluble Salts must be by the 1:2 (v:v) soil: water Extract Method as described in Midwestern Regional, Latest Publication.
    d. Test for Buffer pH by the SMP method as described in Midwestern Regional, Latest Publication.

6. Certified reports on analyses from producers of composted organic materials are required, particularly when sources are changed. Analyses must include all tests for criteria specified.
7. Density Tests: ASTM D1556 Density of Soil and Rock In Place Using Sand Cone Method. ASTM D698 Test Method For Laboratory Compaction Characteristics Of Soil Using Standard Effort.

    a. In-place density tests must be carried out at a rate of one test per 2,000 square feet for each type of material placed.

8. All Soil Components, Soil Blends, and Existing Soil tests specified must be performed by an approved soil testing laboratory. A qualified soils analyst must perform the tests in accordance with ASA designations for particle size; to include percentage of aggregate, silt, clay and organic matter content. Provide the following data:

   a. Test salvaged and existing topsoil as detailed in this section, Part 2: Products, to include, but not limited to:

      1. Mechanical and chemical analysis, including hydrogen ion concentration and percent clay content.
      2. Percentage of organic content.
      3. Amount nutrients in the soil: Ammonium nitrogen, Nitrate nitrogen, Phosphorus, Potassium.
      4. Recommendations on type and quantity of additives required to establish satisfactory pH factor and supply of nutrients to bring nutrients to satisfactory level for planting for each type of plant material. Proposed imported growing medium must be amended with fertilizer in accordance with the recommendations of the soil test analysis.

D. Samples: Prior to ordering the below listed materials, submit representative samples to the Commissioner, for selection and approval. Do not order materials until Commissioner's approval has been obtained. Delivered materials must closely match the approved samples.

1. Mulch: duplicate samples of 1 gallon.
2. Compost: duplicate samples of 1 gallon.
3. Base Loam: duplicate samples of 1 gallon.
4. Coarse Sand: duplicate samples of 1 gallon.
5. Plant Bed Soil, Horticultural Subsoil, and Street Tree Planting Soil, blends after approval of individual components: duplicate samples of 1 gallon each.
6. Sand and Gravel: duplicate samples of 1 gallon.
7. 3/4-inch Crushed Stone: duplicate samples of 1 gallon.

E. Inspections:

1. The Contractor must not place Plant Bed Soil on Horticultural Subsoil prior to inspection and approval of Commissioner for compliance with depth, grading and compaction specifications. The Contractor must request inspection before proceeding.
2. The Contractor must not plant any plant material prior to inspection and approval of Commissioner for compliance with depth, grading and compaction specifications. The Contractor must request inspection before proceeding.

1.11 DELIVERY, STORAGE AND HANDLING

A. Refer to Section 32 93 00 "Plants" for overall material handling requirements.

B. In addition, the following provision is established: Soil Material should not be handled or hauled, placed or compacted when it is wet as after a heavy rainfall or is frozen. Soil should be handled only when the moisture content is less than at field capacity. The Commissioner must

be consulted to determine if the soil is too wet to handle.

C. Store and protect planting soil mixtures and other materials at designated areas of the site. Protect all soil mixtures from excessive leaching by covering with tarpaulin.

D. Store and handle packaged materials in strict compliance with manufacturer's instructions and recommendations. Protect all materials from weather, damage, injury and theft.

E. Sequence deliveries to avoid delay. On-site storage space is permissible only with written notice from Commissioner. Deliver materials only after preparations for placement of planting soil have been completed.

F. Prohibit vehicular and pedestrian traffic on or around stockpiled planting soil.

G. Soil that is to be stockpiled longer than two weeks, whether on or off site, must not be placed in mounds greater than six feet high. If soil stockpiles greater than six feet high are present longer than two weeks then the contractor must break down and disperse soil so that mounds do not exceed the six-foot height restriction for longer than two weeks.

H. Vehicular access to the site is restricted. Before construction, the Contractor must submit for approval a plan showing proposed routing for deliveries and site access.

I. Prior to construction the Contractor must submit for the CM and Commissioner's review and approval a plan showing proposed routing for deliveries and access to the site.

J. Hoists and Cranes: Include all required costs for hoisting materials, including hoist charges, crane costs if required, all crane permits, traffic director, etc. including necessary filing and fees for obtaining permits and approvals.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General:

1. All plant mix material must fulfill the requirements as specified and be tested to confirm the specified characteristics.
2. Samples of individual components of soil mixes in addition to blended soil mixes including mulch materials must be submitted by the Contractor for testing and analysis to the approved testing laboratory. Comply with specific materials requirements specified.

    a. No base component material or soil components for soil mixes must be used until certified test reports by an approved agricultural chemist have been received and approved by the Commissioner.
    b. As necessary, make any and all soil mix amendments and resubmit test reports indicating amendments until approved.

3. The Commissioner may request additional testing by Contractor for confirmation of mix

quality and/or soil mix amendments at any time until completion.

B. Base Loam:

1. Base Loam as required for the work must be free of subsoil, large stones, earth clods, sticks, stumps, clay lumps, roots or other objectionable, extraneous matter or debris. Base Loam must also be free of quack-grass rhizomes, Agropyron repens, and the nut-like tubers of nutgrass, Cyperus esculentus, and all other primary noxious weeds. Base Loam must not be delivered or used for planting while in a frozen or muddy condition. Base Loam for mixing must conform to the following grain size distribution for material passing the #10 sieve:

	Percent Passing	
US Sieve Size Number	Minimum	Maximum
10	---	100
18	85	100
35	70	95
60	50	85
140	36	53
270	32	42
0.002 mm	3	6

2. The ratio of the particle size for 80% passing (D_{80}) to the particle size for 30% passing (D_{30}) must be 8 or less ($D_{80}/D_{30} < 8$). Maximum size must be one-inch largest dimension. The maximum retained on the #10 sieve must be 20% by weight of the total sample. Tests must be by combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition. The organic content must be between 4.0 and 8.0 percent by weight.

3. Chemical analysis must be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium Magnesium, Aluminum, Iron, Manganese, Lead, Cation Exchange Capacity, Soluble Salts, acidity (pH) and buffer pH.

C. Coarse Sand:

1. Sand for Planting Beds and Horticultural Subsoil must be uniformly graded medium to coarse sand consisting of clean, inert, rounded to sub-angular grains of quartz or other durable rock free from loam or clay, mica, surface coatings and deleterious materials with the following gradation.

	Percent Passing	
US Sieve Size Number	Minimum	Maximum
10	100	---
18	60	80
35	25	45

60	8	20
140	0	8
270	0	3
0.002 mm	0	0.5

2. Maximum size must be one-inch largest dimension. The maximum retained on the #10 sieve must be 20% by weight of the total sample. The ratio of the particle size for 70% passing (D_{70}) to the particle size for 20% passing (D_{20}) must be 3.5 or less (D_{70}/D_{20} <3.5). Tests must be by combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition. pH must be less than 7.5.

D. Crushed Stone:

1. Crushed stone (3/4 inch) must consist of one or the other of the following materials:

   a. Durable crushed rock consisting of the angular fragments obtained by breaking and crushing solid or shattered rock and free from a detrimental quantity of thin, flat or elongated or other objectionable pieces.
   b. Durable crushed gravel stone obtained by artificial crushing of gravel boulders or fieldstone with a minimum diameter before crushing of 200 mm.

2. Crushed stone must be reasonably free from clay, loam or deleterious material and must conform to the following gradation:

Percent Passing

US Sieve Size Number	Minimum	Maximum
1 inch	100	---
3/4 inch	90	100
1/2 inch	10	50
3/8 inch	0	20
#4 Sieve	0	5

E. Organic Amendment (Compost):

1. Organic Matter for amending planting soils must be a stable, humus-like material produced from the aerobic decomposition and curing of Leaf Yard Waste Compost, composted for a minimum of one year (12 months). The leaf yard waste compost must be free of debris such as plastics, metal, concrete or other debris. The leaf yard waste compost must be free of stones larger than 1/2", larger branches and roots. Wood chips over 1" in length or diameter must be removed by screening. The compost must be a dark brown to black color and be capable of supporting plant growth with appropriate management practices in conjunction with addition of fertilizer and other amendments as applicable, with no visible free water or dust, with no unpleasant odor, and meeting the following criteria as reported by laboratory tests.

   a. The ratio of carbon to nitrogen must be in the range of 12:1 to 25:1.
   b. Stability must be assessed by the Solvita procedure. Protocols are specified by the Solvita manual (version 4.0). The compost must achieve a maturity index of 6 or

more as measured by the Solvita scale.

c. Pathogens/Metals/Vector Attraction reduction must meet applicable treatment recommendations of the New York State Department of Environmental Conservation.

d. Organic Content must be at least 20 percent (dry weight). One hundred percent of the material must pass a 3/8-inch (or smaller) screen. Debris such as metal, glass, plastic, wood (other than residual chips), asphalt or masonry must not be visible and must not exceed one percent dry weight. Organic content must be determined by weight loss on ignition for particles passing a number 10 sieve according to procedures performed by the West Experiment Station at the University of Massachusetts, Amherst or equal as follows. A 50-cc sub-sample of the screened and mixed compost is ground to pass the number 60 sieve. Two to three grams (+ 0.001g) of ground sample, dried to a constant weight at 105 degrees C is placed into a muffle furnace. The temperature is slowly raised (5C/minute) to 450C and maintained for three hours. The sample is removed to an oven to equilibrate at 105C and the weight is taken. Organic matter is calculated as loss on ignition.

e. pH: The pH must be between 6.5 to 7.2 as determined from a 1:1 soil-distilled water suspension using a glass electrode pH meter American Society of Agronomy Methods of Soil Analysis, Part 2, 1986.

f. Salinity: Electrical conductivity of a one to five soil to water ratio extract must not exceed 2.0 mmhos/cm (dS/m).

g. The compost must be screened to 3/8-inch maximum particle size and must contain no more that 3 percent material finer than 0.002mm as determined by hydrometer test on ashed material.

2. Nutrient content must be determined by the University of Massachusetts Soil Testing Laboratory or equivalent laboratory and utilized to evaluate soil required amendments for the mixed soils. Chemical analysis must be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Aluminum, Magnesium, Iron, Manganese, Lead, Soluble Salts, Cation Exchange Capacity, soil reaction (pH), and buffer ph.

F. Organic Mulch:

1. Refer to Refer to Section 32 93 00 “Plants” for overall material handling requirements.

2.2 PLANTING SOIL MIXES

A. Uniformly mix ingredients by windrowing/tilling on an approved hard surface area. Organic Amendment must be maintained moist, not wet, during mixing. Amendments must not be added unless approved to extent and quantity by the Commissioner, and additional tests have been conducted to verify type and quantity of amendment is acceptable. Percentages of components, unless otherwise noted, must be established upon completion of individual test results for components of the various mixes.

B. Planting Bed Soil must consist of a combination of approximately equal parts Coarse Sand, Base Loam and Organic Amendment.

1. The following gradation for material passing a Number 10 Sieve must be achieved in the final mix.

Percent Passing

US Sieve Size Number	Minimum	Maximum
10	100	---
18	75	93
35	50	80
60	29	56
140	19	30
270	18	23
0.002mm	2	7

2. Maximum size must be one half-inch largest dimension. The maximum retained on the #10 sieve must be 15% by weight of the total sample. The ratio of the particle size for 80% passing (D_{80}) to the particle size for 30% passing (D_{30}) must be 8.0 or less (D_{80}/D_{30} <8.0). The final mix must have an organic content between 5 and 7 percent by weight. The final mix must have a hydraulic conductivity of not less than 2.0 inches per hour according to test procedure ASTM D5856-95 (2000) hour when compacted to a minimum of 86 percent Standard Proctor ASTM D 698. Tests must be by combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition.
3. Chemical analysis must be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium Magnesium, Aluminum, Iron, Manganese, Lead, Cation Exchange Capacity, Soluble Salts, acidity (pH) and buffer PH.

C. Horticultural Subsoil:

1. Base Loam, Coarse Sand and Compost, each as specified above, must be combined in an approximate mix ratio of two parts by volume Sand to one and one half parts by volume Base Loam to one half part by volume Compost (2S:1.5L:0.5C) to create a uniform blend which meets the following requirements.
2. Gradation for material passing the #10 sieve:

Percent Passing

US Sieve Size Number	Minimum	Maximum
10	100	---
18	85	95
35	55	80
60	30	60
140	20	33
270	12	17
0.002mm	1	3

3. Maximum size must be one-inch largest dimension. The maximum retained on the #4 sieve must be 10% by weight of the total sample.
4. Ratio of the particle size for 80% passing (D_{80}) to the particle size for 30% passing (D_{30}) must be 6.5 or less (D_{80}/D_{30} <6.5).
5. Saturated hydraulic conductivity of the mix: not less than 2.5 inches per hour according

to ASTM D5856-95 (2000) when compacted to a minimum of 86% Standard Proctor, ASTM 698.

6. Organic content: between 1.5 and 3.0 percent by weight.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PREINSTALLATION EXAMINATION AND PREPARATION

A. Refer to Section 32 93 00 “Plants” and the Drawings.

B. Testing existing soils.

C. Amending excavated soils for re-use if deemed salvageable and approved by the Commissioner.

D. Coordinate activities with other trades so that there is no soil disturbance from traffic or other construction activities subsequent to placement.

E. Pre-Installation Examination Required: The Contractor must examine previous work, related work, and conditions under which this work is to be performed and must notify Commissioner in writing of all deficiencies and conditions detrimental to the proper completion of this work. Beginning work means Contractor accepts substrates, previous work, and conditions. The Contractor must not place any planting soil until all work in adjacent areas is complete and approved by the Commissioner.

F. Examination of Subgrade: The subgrade must be examined by the Contractor prior to the start of soil placement and planting. Any deficiencies must be noted and related to the Commissioner in writing prior to acceptance of the subgrade by the Contractor. Deficiencies include, but must not be limited to the following:

1. Construction debris present within the planting areas.
2. The subgrade and/or drainage layer is at incorrect depths for installing the designed soil profile.
3. Incomplete subsurface drainage installation.
4. Test Subgrade permeability according to procedures and at locations directed by Commissioner.
5. Subgrade must infiltrate water at the rate of at least one inch per hour.

G. Should the subgrade material become contaminated or for any reason become unsuitable prior to placement of planting soils, correct or replace the subgrade material with satisfactory subgrade material at no additional expense.

H. Should evidence of poor drainage become evident, test drainage pits must be required. Drainage pits must be excavated and filled with water twice in succession. The time at which water is put

into the pit or bed for the second filling must be noted. The Commissioner must then be notified of the time it takes for the pit or bed to drain completely. Backfilling and planting operations must not proceed until the Commissioner has reviewed the test drainage results. Contractor must be responsible for providing appropriate subsurface drainage as required to ensure the longevity of all planted material.

I. Protection of existing trees and adjacent structures in or above the proposed subgrade to prevent any damage during placement or compaction of is the responsibility of the Contractor. Place planting soil mix within the drip line of existing trees using gradall equipment which has a retractable boom to prevent equipment entering within the drip line of existing trees.

J. Planting Soil Preparation: Examine soil and remove foreign materials, stones and organic debris over 1/2" in size. Mix-in fertilizers and amendments as required by tests and as approved by the Commissioner. All preparation and mixing must be accomplished when the soil moisture content is less than field capacity and at a moisture content approved by the Commissioner. If lime is to be added, it must be mixed with dry soil before fertilizer is added and mixed.

3.3 EXCAVATION AND REMOVAL

A. Excess Planting Soil Mixture and Materials: Excess materials are the property of the City of New York, however, the Contractor must remove the excess planting soil mixture and materials from the site, if so requested by the Commissioner, at no additional cost to the City of New York.

B. Coordinate with work in Section 32 93 00 "Plants".

3.4 MIXING OF PLANTING SOIL LAYERS

A. No mixing at the project site must be permitted unless a large, paved area is available for mixing and the site has been approved for use by the Commissioner.

B. Soil blends must be produced with equipment that blends together each component in a thorough and uniform manner.

3.5 BACKFILLING OF PLANTING SOIL LAYERS

A. Refer to Refer to Section 32 93 00 "Plants".

B. Soil Placement Preparation:
   1. Verify that the under-drainage system has been installed and accepted.
   2. Notify the Commissioner of soil placement operations at least seven calendar days prior to the beginning of work.
   3. The plant stock must be placed simultaneously with the planting soil as described in these specifications. The Commissioner must stake trees and shrubs during placement of the planting soil.
   4. Verify that the subgrade passes the minimum water infiltration requirement.

C. Placement of Planting Soil and Subsoil:

1. Placement of Planting Bed Soil and plant stock must be carried out simultaneously to prevent excessive traffic over soil lifts and the final grade so as to prevent the creation of undesirable soil compaction. The contractor must install plants simultaneously with the installation of the lower soil layers. The upper soil layers must not be installed before all plants are installed and before the acceptance by the Commissioner.
2. Planting Bed and Horticultural Subsoil must be placed in lifts not to exceed 8 inches in thickness and compacted to meet minimum and maximum requirements as specified below:

    a. A transition zone must be formed between the Subsoil and Planting Bed Soil by placing one inch of Planting Bed over the Subsoil and raking a two-inch thickness.
    b. Horticultural Subsoil must be compacted to between 86 and 88 percent Standard Proctor, except soils beneath the root balls must be compacted to between 88 and 92% Standard Proctor to create a firm pedestal and prevent settlement of the root balls.
    c. Planting Bed Soil must be compacted to between 84 and 86 percent Standard Proctor.
    d. In all cases, the soil being placed must be in a dry to damp condition. No wet soils must be placed. All testing of in-place density for planting materials must be made according to ASTM D1556.

D. Open Tree Planting: Trees planted in open turf areas must be planted according to the standard open tree root ball pit design as illustrated in the Drawings.

E. Area is to be made secure and safe at the end of work day.

3.6 PROTECTION

A. Refer to Section 32 93 00 “Plants”.

B. Protect newly graded areas from traffic, freezing and erosion. Keep free of trash, debris or construction materials from the work of other trades.

C. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or compaction due to subsequent construction operations or weather conditions. Scarify or remove and replace material to a depth as directed by the Commissioner; reshape and re-compact at optimum moisture content to the required density.

D. Where settling occurs, before final acceptance or during the guarantee period, remove finish surfacing, backfill with additional approved material, compact to specified rates, and restore any disturbed areas to a condition acceptable to the Commissioner.

3.7 COORDINATION AND EXCESS MATERIALS

A. Coordinate activities with other trades so that there is no soil disturbance from traffic or other construction activities subsequent to placement.

B. Excess Planting Soil Mixtures and Materials: Remove the excess planting soil mixture and materials from the site at no additional cost to the City of New York unless otherwise requested.

3.8 POST-INSTALLATION TESTING

A. In-place density testing is required in all areas. The standard test for surface and subsurface density must be ASTM D-1556.

3.9 CLEAN-UP

A. Upon completion of installation of soils, clean areas with the contract limits. Remove all excess fills, soils, and stockpiles and legally dispose of all waste materials, trash and debris. Remove all tools and equipment and provide a clean, clear site.

B. Sweep, do not wash, all paving and other exposed surfaces of dirt and mud until the paving has been installed over soil materials. Do no washing until finished materials covering soil materials are in place.

END OF SECTION 32 05 13

SECTION 32 13 13 – CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. New Portland cement concrete sidewalks and paving.
2. Steel curb facings, as indicated or required.
3. Concrete sidewalk and pavement replacement and patching, to the extent shown on the Drawings, and as required by site conditions and NYCDOT.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product data, test reports, and materials' certifications, as required by the Commissioner.

B. Sustainable Design Submittals:

1. Environmental Product Declaration (EPD): For each product.
2. Laboratory Test Reports: For concrete paving mixtures, documentation indicating that cured concrete complies with Solar Reflectance Index requirements.

C. Design Mixtures: For each concrete pavement mixture. Include alternate mixture designs when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

D. Shop Drawings: Provide detailed shop drawings. Include plans, elevations, sections, details, and attachments/abutment to other work. Indicate pavement markings, lane separations, and defined parking spaces. Indicate, with NYC and NYS dynamic symbol of accessibility, spaces allocated for people with disabilities.

1. Shop drawings will clearly indicate the specific scope of removed, replaced, or patched work required. Re-built concrete pavement assemblies will be re-constructed to the sizes, dimensions and other characteristics indicated on the Drawings and meeting requirements of NYCDOT.

E. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:

1. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.

F. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Admixtures.
4. Applied finish materials.
5. Bonding agent or epoxy adhesive.
6. Joint fillers.

G. Maintenance Data: Submit manufacturer's maintenance instructions or recommendations for paving to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94 requirements for production facilities and equipment.

1. Company specializing in the Work of this Section will have three years' experience and jobs with similar quantity of material.

C. Regulatory Requirements: Materials and methods of construction will conform to:

1. "Standard Specifications - New York City Department of Transportation, Bureau of Highway Operations" with latest amendments. (NYCDOT Standard Specifications).
   a. Section numbers referred to in Parts 2 and 3 of this Specification Section, such as "Section 4.13.3(b)" or "Section 2.23", etc. refer to the sections given in the NYCDOT Standard Specification which govern this work outside the street line.

2. "Standard Details of Construction" of the New York City Department of Transportation, Bureau of Traffic Operations - Street Design, with latest amendments. (NYCDOT Standard Details)
   a. "NYCDOT Standard Details": Drawing numbers referred to in Parts 2 and 3 of this Specification Section, such as "Drawing H-1044" or "Drawing H-1010", etc., refer to the Drawings in the NYCDOT Standard Details which govern this work outside the street line.

3. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.

4. Where more stringent requirements are given in this Specification Section, the requirements of this Specification Section will govern.

D. Contractor will be responsible for all filing and permits required for sidewalk patching and replacement.

E. Mockups: Provide a cast-in-place mockup of a full-size sections of concrete pavement to demonstrate typical joints, surface finish, texture, color, and standard of workmanship.

1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Commissioner.
2. Notify Commissioner seven days in advance of dates and times when mockups will be constructed.
3. Obtain Commissioner's approval of mockups before starting construction.
4. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed pavement.
5. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

F. Preinstallation Conference: Conduct conference at Project site.

1. Before submitting design mixtures, review concrete pavement mixture design and examine procedures for ensuring quality of concrete materials and concrete pavement construction practices. Require representatives, including the following, of each entity directly concerned with concrete pavement, to attend conference:
   a. Contractor's superintendent.
   b. Independent testing agency responsible for concrete design mixtures.
   c. Ready-mix concrete producer.
   d. Concrete pavement subcontractor.

G. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.2 MATERIALS

A. Sidewalk Foundation Material: Material for sidewalk and driveway foundation course will conform to the requirements of Section 2.02 for size No. 3 broken stone or gravel. Foundation course will be 6" thick.

1. Solar Reflectance Index: Sidewalks/pavements will have minimum SRI of 29, complying with ASTM E1980.

B. Concrete for Sidewalks: Concrete will comply with the requirements of Section 4.13.3(b). Cement used will be Type IIa.

C. Preformed Expansion Joint Filler: Material will conform to the requirements of Section 2.15, 1/4"thick, Type IV.

D. Welded Steel Wire Fabric: Material will conform to the requirements of Section 2.25. Fabric will be 6x6-W2.9xW2.9 wherever fabric is indicated.

E. Steel Bars for Concrete Reinforcement: Material will conform to the requirements of Section 2.23, Type I, Grade 60.

F. Concrete Base for Pavement: Material will comply with the requirements of Section 4.04.3.

G. Concrete Pavements: Concrete materials will comply with the requirements for Section 4.05.3.

H. Curbs: Concrete and steel facing will comply with the requirements of Section 4.09.3, except the minimum compressive strength will be 3500 psi.

1. Provide type, size and shape of curb to match existing adjoining curbs.

2.3 CONCRETE MIXTURES

A. General: Provide Class B-32, Type 1A air-entrained concrete with a minimum compressive strength of 3,200 psi at 28 days, in accordance with "Section 3.05 Concrete" of the reference standard.

1. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.
2. Use a qualified independent testing agency for preparing and reporting proposed concrete mixture designs for the trial batch method.

B. Proportion mixtures to provide concrete with the specified properties.

C. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content in accordance with the referenced standard.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Subgrade: Perform excavating, filling and compacting to provide a finished subgrade at the proper elevations. Comply with Section 4.13 of the reference standard.

1. Remove loose material from compacted subbase surfaces immediately before placing concrete.

C. Do not start excavation around city monuments and benchmarks until said monuments or benchmarks have been referenced and reset or otherwise disposed of by the City of New York. Furnish labor and materials required to remove, care for, and reset all such monuments and benchmarks.

D. Carefully remove all existing signage at locations where new sidewalks are to be installed and store on the premises in a safe place, protected from the weather. Ten days prior to their removal, notify in writing the New York City Department of Traffic when signs will be ready for pick-up by the Department of Traffic. Forward copy of the letter to the Traffic Department to the Commissioner.

E. Proceed with concrete pavement operations only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.5 CONCRETE PLACEMENT

A. General: Provide concrete paving to comply with NYCDOT requirements, as indicated below and as otherwise specified in this Section:

B. General: Comply with Section 4.13 of the referenced standard.

C. Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.

D. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.

E. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

F. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

G. Do not add water to concrete during delivery or at Project site.

H. Do not add water to fresh concrete after testing.

I. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

J. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.

K. Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay welded wire fabric or fabricated bar mats immediately in final position. Place top layer of concrete, strike off, and screed.

1. Remove and replace concrete that has been placed for more than 15 minutes without being covered by top layer, or use bonding agent if approved by Commissioner.

L. Screed pavement surfaces with a straightedge and strike off.

M. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

N. Curbs: Comply with Section 4.09 of the reference standard.

O. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.

P. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.6 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

3.7 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

D. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.8 PAVEMENT TOLERANCES

A. Comply with tolerances of ACI 117 and as follows:

1. Elevation: 1/4 inch.
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-foot- long, unleveled straightedge not to exceed 1/4 inch.
4. Joint Spacing: 3 inches.
5. Contraction Joint Depth: Plus 1/4 inch, no minus.
6. Joint Width: Plus 1/8 inch, no minus.

3.9 PATCHING OF EXISTING PAVING

A. Damaged concrete will be removed to a full joint and replaced. Partial patching within the sidewalk will not be accepted. Commissioner will determine extent of removal and replacement. Follow the guidelines below for repair and new work to be performed:

1. Finish surface to grade and cross-section by suitable wood floats. After floating, trowel as required to produce a smooth, dense surface and then finish with a fine hair push broom drawn over the surface transverse to the line of traffic. Before the final finish, the surface of the walks will be checked and any irregularities of more than 1/8 in. in 10 ft. will be eliminated.
2. Divide the surface of walks into rectangular areas as shown, by means of control joints. Form control joints in the fresh concrete by cutting a groove in the top portion of the slab and finishing all edges using a jointing tool. The completed surface will be uniform in color and free of surface blemishes and tool marks.
3. Expansion Joints: Provide transverse expansion joints as shown and where curbs are adjacent to walks. Provide expansion joints where walks abut steps or other structures.
4. After finishing operations are completed, round joint edges with an edging tool and remove concrete from joint opening.

B. Drill test cores where directed by Commissioner when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement bonded to pavement with epoxy adhesive.

3.10 FIELD QUALITY CONTROL

A. Testing: Pay for tests required by NYCDOT to ensure compliance with NYCDOT Specifications. Pay for any tests such as cores required by the Commissioner when such tests show non-conformance with the Drawings and Specifications.

1. Concrete testing is described in Division 03 Section 03 30 00 “Cast-in-Place Concrete” of these Specifications.

B. Inspection: Concrete work is treated as Special Inspection and is described in Division 03 Section “03 30 00 Cast-in-Place Concrete” of these Specifications.

END OF SECTION 32 13 13

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 32 31 13 – CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Chain link fences.
2. Swing gates
3. Anchorage and installation accessories.
4. Privacy slats, where indicated.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Inspect and discuss electrical roughing-in, equipment bases, and other preparatory work specified elsewhere.
2. Review sequence of operation for each type of gate operator.
3. Review coordination of interlocked equipment specified in this Section and elsewhere.
4. Review required testing, inspecting, and certifying procedures.

1.4 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.5 SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:

a. Fence and gate posts, rails, and fittings.
b. Chain-link fabric, reinforcements, and attachments.
c. Accessories: Privacy slats.
d. Gates and hardware.

B. Shop Drawings: For each type of fence and gate assembly.

1. Include plans, elevations, sections, details, and attachments to other work.
2. Include accessories, hardware, gate operation, and operational clearances.

C. Product Certificates: For each type of chain-link fence, and gate.

D. Product Test Reports: For framework strength according to ASTM F 1043, for tests performed by manufacturer and witnessed by a qualified testing agency or a qualified testing agency.

E. Field quality-control reports.

F. Sample Warranty: For special warranty.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

1.7 FIELD CONDITIONS

A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.8 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure to comply with performance requirements.
b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Chain-link fence and gate frameworks will withstand the design wind loads and stresses for fence height(s) and under exposure conditions indicated according to ASCE/SEI 7.

1. Design Wind Load: As indicated on Drawings or required by the Building Code.

a. Minimum Post Size: Determine according to ASTM F 1043 for post spacing not to exceed 10 feet for Material Group IA, ASTM F 1043, Schedule 40 steel pipe or Group IC, electric-resistance-welded round steel pipe.
b. Minimum Post Size and Maximum Spacing: Determine according to CLFMI WLG 2445, based on mesh size and pattern specified.

B. Lightning Protection System: Maximum resistance-to-ground value of 25 ohms at each grounding location along fence under normal dry conditions.

2.2 CHAIN-LINK FENCE FABRIC

A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist according to "CLFMI Product Manual" and requirements indicated below:

B. Dimensions indicated for pipe and roll-formed sections are outside dimensions.

C. Steel Fencing and Fabric

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Anchor Fence, Inc.
b. Colorguard Fence Products, Inc.
c. Cyclone Fence.
d. Or approved equal.

D. Materials: Steel chain link fabric will be furnished in accordance with ASTM F-668 Class 2a or 2b. The steel core wire will be galvanized in accordance with ASTM A 641-71 A.

1. Wire Gage and Size: No. 9 gage (0.148 inch + 0.005 inch) size steel wires, 2-inch mesh, with both top and bottom selvages twisted and barbed for fabric.
2. Furnish one-piece fabric widths for fencing.
3. Zinc-Coated Fabric: ASTM A392, Type II, Class 1, 1.2 oz./sq. ft. with zinc coating applied after weaving.
4. Color: As selected by Commissioner.

2.3 FRAMING COMPONENTS

A. Framework: Posts and rails will be in conformance with ASTM F 669, Table 2, for either 6063 T6 aluminum pipe or galvanized steel pipe conforming to ASTM A 120, (Schedule 40), as a minimum, and not less than as follows:

1. Provide manufacturer's standard Type 1, Schedule 40 pipe with 1.8 ounce per square foot zinc coating conforming ASTM A 120.

B. Hardware and Accessories: Provide manufacturer's standard hardware and accessories, except as otherwise indicated.

C. Terminal and Corner Posts: 3 inch square, weighing 7.04 lbs. per foot.

D. Gate Posts: 4 inch O.D., Schedule 40.

E. Line Posts: 2.50" O.D. Steel pipe, Schedule 40.

F. Top and Bottom Rail: 1.66 inch O.D. Steel pipe, 2.27 lbs. per lineal foot.

G. Tubular Post Tops: Weather tight closure caps, 1 top for each post. Provide tops with openings to accommodate top rails. Finish matching framework finish.

H. Sleeves, Stretcher Bars, Stretcher Bands, Clips, Ties, Rail Ends, Fasteners, Fittings and Accessories: Provide manufacturer's standard complying with CLFMI specifications. Finish matching framework finish.

I. Gate Frame: 2 inch square anodized aluminum, weighing 2.6 lbs. per foot.

J. Metal Shoes: Provide aluminum or hot-dip galvanized shoes as indicated and as required for support of the fence on the roof slab.

2.4 TENSION WIRE

A. Metallic-Coated Steel Wire, where rail is not provided: 0.177-inch-diameter, marcelled tension wire according to ASTM A 817 or ASTM A 824, with the following metallic coating:

1. Type II: Zinc coated (galvanized) by hot-dip or electrolytic process, with the following minimum coating weight:

a. Class 4: Not less than 1.2 oz./sq. ft. of uncoated wire surface.

2.5 SWING GATES

A. General: ASTM F 900 for gate posts and single swing gate types.

1. Gate Leaf Width: As indicated.
2. Framework Member Sizes and Strength: Based on gate fabric height as indicated.

B. Pipe and Tubing:

1. Zinc-Coated Steel: ASTM F 1043 and ASTM F 1083; protective coating and finish to match fence framework.
2. Gate Posts: Round tubular steel.
3. Gate Frames and Bracing: Round tubular steel.

C. Frame Corner Construction: Welded or assembled with corner fittings.

D. Hardware:

1. Hinges: 360-degree inward and outward swing.

2. Latch: Permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.
3. Lock: Manufacturer's standard internal device.
4. Closer: Manufacturer's standard.

2.6 FITTINGS

A. Provide fittings according to ASTM F 626.

2.7 GROUT AND ANCHORING CEMENT

A. Non-shrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout, recommended in writing by manufacturer, for exterior applications.

B. Anchoring Cement: Factory-packaged, non-shrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating, and that is recommended in writing by manufacturer for exterior applications.

2.8 GROUNDING MATERIALS

A. Connectors and Grounding Rods: Listed and labeled for complying with UL 467.

1. Connectors for Below-Grade Use: Exothermic welded type.
2. Grounding Rods: Copper-clad steel, 5/8 by 96 inches.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for pavement work, and other conditions affecting performance of the Work.

1. Do not begin installation before final grading is completed unless otherwise permitted by Commissioner.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.4 CHAIN-LINK FENCE INSTALLATION

A. Install chain-link fencing according to ASTM F 567 and more stringent requirements specified.

B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacing indicated, in firm, undisturbed soil.

C. Post Setting: Set posts in concrete or with mechanical anchors to existing surfaces, at indicated spacing into firm, undisturbed soil.

1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.

a. Exposed Concrete: Extend 2 inches above grade; shape and smooth to shed water.
b. Concealed Concrete: Place top of concrete 2 inches below gradeto allow covering with surface material.
c. Posts Set into Sleeves in Concrete: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with non-shrink, nonmetallic grout or anchoring cement, mixed and placed according to anchoring material manufacturer's written instructions. Finish anchorage joint to slope away from post to drain water.
d. Posts Set into Holes in Concrete: Form or core drill holes not less than 5 inches deep and 3/4 inch larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with non-shrink, nonmetallic grout or anchoring cement, mixed and placed according to anchoring material manufacturer's written instructions. Finish anchorage joint to slope away from post to drain water.

D. Terminal Posts: Install terminal end, corner, and gate posts according to ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more. For runs exceeding 500 feet, space pull posts an equal distance between corner or end posts.

E. Line Posts: Space line posts uniformly at 96 inches o.c.

F. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.

1. Locate horizontal braces at midheight of fabric 72 inches or higher, on fences with top rail, and at two-third fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.

G. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.

H. Intermediate and Bottom Rails: Secure to posts with fittings.

I. Chain-Link Fabric: Apply fabric to enclosing framework. Leave 1-inch bottom clearance between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

J. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts, with tension bands spaced not more than 15 inches o.c.

K. Tension Wire, where used: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch-diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches o.c. Install tension wire in locations indicated before stretching fabric. Provide horizontal tension wire at the following locations:

1. Extended along top of fence fabric. Install top tension wire through post cap loops. Install bottom tension wire within 6 inches of bottom of fabric and tie to each post with not less than same diameter and type of wire.

L. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric according to ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.

1. Maximum Spacing: Tie fabric to line posts at 12 inches o.c. and to braces at 24 inches o.c.

M. Fasteners: Install nuts for tension bands and carriage bolts on the side of fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

N. Privacy Slats: Install slats in direction indicated, securely locked in place.

1. Direction and privacy factor as indicated on Drawings.

3.5 GATE INSTALLATION

A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing.

B. Attach hardware using tamper-resistant or concealed means.

C. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation.

3.6 GROUNDING AND BONDING

A. Fence and Gate Grounding:

1. Ground for fence and fence posts will be a separate system from ground for gate and gate posts.
2. Install ground rods and connections at maximum intervals of 1500 feet.
3. Fences within 100 Feet of Buildings, Structures, Walkways, and Roadways: Ground at maximum intervals of 750 feet.
4. Ground fence on each side of gates and other fence openings.

   a. Bond metal gates to gate posts.
   b. Bond across openings, with and without gates, except openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18 inches below finished grade.

B. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.

C. Connections:

1. Make connections with clean, bare metal at points of contact.
2. Make above-grade ground connections with mechanical fasteners.
3. Make below-grade ground connections with exothermic welds.
4. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

D. Bonding to Lightning Protection System: Ground fence and bond fence grounding conductor to lightning protection down conductor or lightning protection grounding conductor according to NFPA 780.

3.7 ADJUSTING

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Lubricate hardware and other moving parts.

END OF SECTION 32 31 13

SECTION 32 31 19 – DECORATIVE FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Decorative steel fence.

1.3 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's technical data, specifications, and installation instructions for fence and fence posts, grills, and accessories.

B. Shop drawings showing location of fence, each post, and details of post installation, and accessories.

1. Show layout, dimensions, spacing of components, interface with hardware and anchorage and installation details.

C. Samples: Submit samples of same thickness and finish indicated for final unit of Work.

1. 6-inch-long sections of each distinctly different fence member.
2. Fittings and brackets.
3. Welded connections.

D. Welding certificates: Submit certificates showing compliance with AWS standards.

1.5 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Single-Source Responsibility: Obtain decorative fence as complete units, including necessary erection accessories, fittings, hardware and fastenings from a single source or manufacturer.

C. Contractor's Engineer Qualifications: Professional engineer licensed in the State of New York

and experienced in providing engineering services of the kind indicated for ornamental fences similar to this Project in material, design, and extent, and that have a record of successful in-service performance.

D. Installer Qualifications: An experienced installer who has completed fences similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

E. Welding Standards: Comply with applicable provisions of AWS D1.1 "Structural Welding Code--Steel".

F. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Include 5-foot length of fence complying with requirements.
2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

G. Preinstallation Conference: Conduct conference at Project site.

1.6 PROJECT CONDITIONS

A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible, to ensure proper fitting of fences. Do not delay job progress; allow for adjustments and fitting where taking of field measurements before fabrication might delay Work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store metal components and materials in clean, dry location, away from uncured concrete and masonry. Cover with waterproof paper, tarpaulin or polyethylene sheeting in a manner that permits air circulation within covering.

B. Handle fences on site to a minimum; exercise care to avoid damaging metal finishes.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Engineering Requirements: Design decorative fences, including comprehensive engineering analysis by a qualified professional engineer, licensed in the State of New York using performance requirements and design criteria indicated.

B. Structural Performance: Decorative fence framework will withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to ASCE/SEI 7:

1. Minimum Post Size and Maximum Spacing: Determine according to CLFMI WLG 2445, based on mesh size and pattern specified and on the following:

   a. Wind Loads: 100 mph.
   b. Exposure Category: C.
   c. Fence Height: As shown.
   d. Material Group: IA, ASTM F 1043, Schedule 40 steel pipe.

2.2 STEEL AND IRON

A. Plates, Shapes, and Bars: ASTM A 36.

B. Bars (Pickets): Hot-rolled, carbon steel complying with ASTM A 29, Grade 1010.

C. Tubing: ASTM A 500, cold-formed steel tubing.

D. Iron Castings: Malleable iron complying with ASTM A 47, Grade 32510.

2.3 MISCELLANEOUS MATERIALS

A. Welding Electrodes and Filler Metal: Type and alloy of filler metal and electrodes as recommended by producer of metal to be welded, complying with applicable AWS specifications, and as required for color match, strength and compatibility.

B. Fasteners: Of same basic metal and alloy as fastened metal, unless otherwise indicated. Do not use metals which are corrosive or otherwise incompatible with metals joined.

   1. Where acceptable, provide stainless-steel carriage bolts and tamperproof nuts.

C. Provide concealed fasteners, unless otherwise indicated. Where exposed fasteners are indicated or required provide fasteners of material, head design and installation pattern as selected by the Commissioner.

D. Non-shrink Grout: Factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107 and specifically recommended by manufacturer for exterior applications.

E. Anchors and Inserts: Provide anchors of type, size, and material required for conditions shown. Use nonferrous metal or hot-dipped galvanized anchors and inserts for exterior locations and elsewhere as required for corrosion resistance.

F. Bituminous Paint: SSPC-Paint 12 (cold-applied asphalt mastic).

G. Concrete: Normal-weight, air-entrained, ready-mix concrete complying with requirements in Division 03 Section 03 30 00 “Cast-in-Place Concrete" with a minimum 28-day compressive strength of 3000 psi.

2.4 DECORATIVE STEEL PICKET FENCES

A. Basis of Design: Subject to compliance with requirements, provide "Montage II", decorative fence, as manufactured by Ameristar Fence Products or comparable product by one of the following:

1. Fortress Building Products: Versai
2. Aleko: Madrid
3. Or Approved Equal.

B. General: Comply with ASTM F 2408, for residential or light industrial (commercial) application (class), unless otherwise indicated.

1. Steel material for fence panels and posts will conform to the requirements of ASTM A653, with a minimum zinc (hot-dip galvanized) coating weight of 0.90 oz/ft2, Coating Designation G-90.
2. Posts, Rails and Pickets: Square tubes, rails and bars of sizes, dimensions, and spacing as indicated below and on the Drawings.

a. Posts: 3 inch square posts, 0.1046 inch thickness.
b. Post Caps: Formed from steel sheet and hot-dip galvanized after forming.
c. Rails: Steel channel; 1-3/4 inch square, 0.1046 inch thickness.
d. Pickets: 1 inch square, 00747 inch thickness with decorative top finial.

2.5 FABRICATION

A. Pickets, rails and posts will be pre-cut to specified lengths and inserted into the pre-punched holes in the rails. Aligned pickets and rails will be joined at each picket-to-rail intersection by manufacturer's proprietary fusion welding process, forming a rigid panel assembly.

B. Finish/Coating: Formed fencing posts, rails and pickets will be treated with an electrodeposited coating process consisting of a multi-stage pretreatment/wash (with zinc phosphate), followed by a duplex application of an epoxy primer and an acrylic topcoat.

C. Form fence/guardrail assemblies to required shapes and sizes, with true lines and angles. Provide components in sizes and profiles indicated, and as required for structural performance.

D. Allow for thermal movement due to 100 deg. F range in ambient temperature, in the installed metal assemblies, to prevent buckling, opening up of joints and overstressing of welds and fasteners. Base design calculations on actual surface temperatures of metals.

E. Provide necessary rebates, lugs and brackets for assembly of units. Use concealed fasteners wherever possible.

F. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges slightly. Remove sharp edges on exposed surfaces.

G. Shear and punch metals cleanly and accurately. Remove burrs. Remove sharp or rough areas on exposed traffic surfaces.

H. Ease exposed edges to a radius of approximately 1/32 inch. Form bent-metal corners to smallest radius possible without impairing work.

I. Weld corners and seams continuously to comply with AWS recommendations and the following:

1. Minimize distortion and develop strength of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Finish exposed welds smooth, flush with adjacent surfaces with no visible inclusions or pits.
5. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Use exposed fasteners where indicated of driver type as indicated or selected by the Commissioner. Locate joints where least conspicuous.
6. Provide for anchorage of type indicated. Fabricate and space anchoring devices to provide adequate support for intended use.
7. Preassemble items in shop where possible. Disassemble units only as necessary for shipping and handling. Use connections that maintain structural value of joined pieces.
8. Cut, reinforce, drill and tap miscellaneous metal work as required to receive finish hardware, screws, and similar items.

J. Fasteners: Manufacturer's standard tamperproof, corrosion-resistant, color-coated fasteners matching fence components.

2.6 FINISHES

A. Finish/Coating: Formed fencing posts, rails and pickets will be treated with an electrodeposited coating process consisting of a multi-stage pretreatment/wash (with zinc phosphate), followed by a duplex application of an epoxy primer and an acrylic topcoat.

1. Color and Gloss: As selected by Commissioner from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, construction layout, and other conditions affecting performance of the Work.

B. Do not begin installation before final grading is completed unless otherwise permitted by Commissioner.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Stake locations of fence lines and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, underground structures, benchmarks, and property monuments.

3.4 DECORATIVE FENCE INSTALLATION

A. Install fences according to manufacturer's written instructions.

B. Install fences by setting posts as indicated and fastening rails to posts. Peen threads of bolts after assembly to prevent removal.

C. Post Setting: Set posts on existing concrete with mechanical anchors at indicated spacing.

1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with mechanical devices.

2. Posts Set in Concrete: Extend post to within 6 inches of specified excavation depth, but not closer than 3 inches to bottom of concrete.

3. Posts Set into Concrete in Sleeves: Use galvanized-steel pipe sleeves with inside diameter at least 3/4 inch larger than outside diagonal dimension of post, preset and anchored into concrete for installing posts.

   a. Extend posts at least 5 inches into sleeve.
   b. After posts have been inserted into sleeves, fill annular space between post and sleeve with non-shrink grout, mixed and placed to comply with grout manufacturer's written instructions; shape and smooth to shed water. Finish and slope top surface of grout to drain water away from post.

4. Posts Set into Voids in Concrete: Form or core drill holes not less than 3/4 inch larger than outside diagonal dimension of post.

   a. Extend posts at least 5 inches into concrete.
   b. Clean holes of loose material, insert posts, and fill annular space between post and concrete with non-shrink grout, mixed and placed to comply with grout manufacturer's written instructions. Finish and slope top surface of grout to drain water away from post.

5. Space posts uniformly at 6 feet o.c., maximum unless otherwise shown.

END OF SECTION 32 31 19

SECTION 32 93 00 – PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section Includes:

1. Plants.
2. Tree-watering devices.
3. Tree stabilization systems and materials.

1.3 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.

C. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 32 05 13 "Soils for Exterior Improvements" for drawing designations for planting soils.

D. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples of each type of mulch.

C. Full sized samples for each type of tree stabilization system or materials.

1.7 INFORMATIONAL SUBMITTALS

A. Product certificates.

B. Sample Guarantee.

1.8 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by the Commissioner for maintenance of plants during a calendar year.

1.9 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements.”

B. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.

1. Pesticide Applicator: New York State licensed, commercial.

C. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver bare-root stock plants within 36 hours of digging. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting. Transport in covered, temperature-controlled vehicles, and keep plants always cool and protected from sun and wind.

B. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

C. Handle planting stock by root ball.

D. Deliver plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1.11 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

B. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare must be visible before planting.

1.12 PLANTING AREA ESTABLISHMENT

A. General: Prepare planting area for soil placement and mix planting soil according to Section 32 05 13 "Soils for Exterior Improvements".

B. Before planting, obtain Commissioner's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

1.13 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits.

1. Excavate planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
2. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
3. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.

B. Backfill Soil: Subsoil and topsoil removed from excavations may be used as backfill soil unless otherwise indicated.

1.14 TREE AND SHRUB PLANTING

A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Set each plant plumb and in center of planting pit or trench with root flare 2 inches above adjacent finish grades.

1. Backfill: Planting soil. For trees indicated in applications other than vegetated roof systems, use excavated soil for backfill.
2. Balled and Burlapped Stock: After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
3. Balled and Potted and Container-Grown Stock: Carefully remove root ball from container without damaging root ball or plant.
4. Fabric Bag-Grown Stock: Carefully remove root ball from fabric bag without damaging root ball or plant. Do not use planting stock if root ball is cracked or broken before or during planting operation.
5. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
6. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.

    a. Quantity: Three for each caliper inch of plant, unless otherwise indicated.

7. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

1.15 TREE AND SHRUB PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape trees and shrubs according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Commissioner, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.

C. Do not apply pruning paint to wounds.

1.16 GROUND COVER AND PLANT PLANTING

A. Set out and space ground cover and plants other than trees and shrubs as indicated on Drawings in even rows with triangular spacing.

B. Use planting soil for backfill, unless otherwise indicated.

C. Dig holes large enough to allow spreading of roots.

D. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

E. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

F. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

1.17 PLANTING AREA MULCHING

A. Mulch backfilled surfaces of planting areas and other areas indicated.

1. Organic Mulch and mineral Mulch in Planting Areas: Apply a minimum of 4-inch average thickness of organic mulch over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.

1.18 INSTALLATION OF SLOW-RELEASE WATERING DEVICE

A. Provide one device for each tree.

1.19 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.

B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices, when possible, to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

D. Apply pesticides and other chemical products and biological control agents according to New York State Department of Environmental Protection and manufacturer's written recommendations. Coordinate applications with Commissioner's operations and other trades in proximity to the Work. Notify Commissioner before each application is performed.

E. Protect plants from damage due to landscape operations and operations of other trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

F. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

1.20 GUARANTEE SERVICE

A. Contractor's Guarantee Obligation: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance" Article. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established for period below:

1. Guarantee Period for Trees and Shrubs: 2 years from date of planting completion.
2. Guarantee Period for Ground Cover and Other Plants: 2 years from date of planting completion.

PART 2 - PRODUCTS

2.1 TREE-WATERING DEVICES

A. Slow-Release Watering Device: Standard product manufactured for drip irrigation of plants and emptying its water contents over an extended time period; manufactured from UV-light-stabilized nylon-reinforced polyethylene sheet, or HDPE plastic.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. BIO-PLEX.
b. Engineered Watering Solutions; PQ Partners, LLC.
c. Spectrum Products, Inc.
d. Or approved equal.

2.2 TREE STABILIZATION

A. Trunk-Stabilization Materials:

1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal by length indicated, pointed at one end.
2. Flexible Ties: Wide rubber or elastic bands or straps of length required to reach stakes or turnbuckles or compression springs, as directed by the Commissioner.
3. Guys and Tie Wires: ASTM A641/A641M, Class 1, galvanized-steel wire, two-strand, twisted, 0.106 inch in diameter.
4. Tree-Tie Webbing: UV-resistant polypropylene or nylon webbing with brass grommets.
5. Guy Cables: Five-strand, 3/16-inch- diameter, galvanized-steel cable, with zinc-coated turnbuckles or compression springs, a minimum of 3 inches long, with two 3/8-inch galvanized eyebolts.
6. Flags: Standard surveyor's plastic flagging tape, white, 6 inches long.

7. Staking-and-Guying Devices: Stake or anchor and adjustable tie systems to secure each new planting by plant stem; sized as indicated and according to manufacturer's written recommendations.

B. Tree Stabilization System:

1. Provide anchoring cable of alloy and gauge/ strength to withstand load requirements.
2. Provide hollow metal tube attachment of alloy and gauge required for proper, complete installation.
3. Provide arbor tie, to match Commissioner's approved samples.

C. Basis-of-Design Product: Subject to compliance with requirements, provide "Platipus Cable Rootball Fixing System with Plat-Mat" as manufactured by Platipus Extra Anchoring Systems or comparable product by one of the following:

1. Ancrest
2. Greenmax
3. Or approved equal.

D. Root-Ball Stabilization: Install at- or below-grade stabilization system to secure each new planting by the root ball unless otherwise indicated.
1. Root-Ball Stabilization Device: Install root-ball stabilization system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.

2.3 FERTILIZERS

A. Planting Tablets: Tightly compressed chip-type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets may break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.

1. Size: Minimum 5-gram tablets.
2. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

2.4 MULCHES

A. Organic Mulch: Shredded hardwood.

B. Mineral Mulch: Crushed stone or gravel.

1. Size Range: 1-1/2 inches maximum, 3/4 inch minimum.
2. Color: As selected by the Commissioner.

2.5 PESTICIDES

A. General: Pesticide registered and approved by the EPA, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by Commissioner.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 PLANTING SCHEDULE

A. All landscaping must be completed within the construction schedule.

END OF SECTION 32 93 00

SECTION 32 96 00 - TRANSPLANTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents apply to all required work for the Project: (1) the Contract Drawings, (2) the Specifications, (3) the General Conditions, (4) the Addendum and (5) the Contract "City of New York Standard Construction Contract".

1.2 SUMMARY

A. Section includes:

1. Transplanting non-nursery-grown tree by digging and boxing.

B. Related Requirements:

1. Section 32 01 90.33 "Tree and Shrub Preservation" for protecting, trimming, pruning, repairing, and replacing existing trees to remain that interfere with, or are affected by, execution of the Work.

1.3 DEFINITIONS

A. General: See definitions in ANSI A300 (Part 6) and in ANSI Z60.1 pertaining to field-grown tree, except as otherwise defined in this Section.

B. Caliper: Diameter of a trunk as measured by a diameter tape or the average of the smallest and largest diameters at a height 6 inches above the root flair for tree up to, and including, 4-inch size at this height; and as measured at a height of 12 inches above the root flair for tree larger than 4-inch size.

C. Root-Ball Depth: Measured from bottom of trunk flare to the bottom of root ball.

D. Root-Ball Width: Measured horizontally across the root ball with an approximately circular form or the least dimension for non-round root balls, not necessarily centered on the tree trunk, but within tolerance according to ANSI Z60.1.

E. Root Flare: Also called "trunk flare." The area at the base of the tree's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to transplanting work include, but are not limited to, the following:

    a. Construction schedule. Verify availability of materials, personnel, equipment, and unimpeded access needed to make progress and avoid delays.
    b. Tree and plant protection.
    c. Tree maintenance.

1.5 SUBMITTAL PROCEDURES

A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification: For each of the following:

1. Slow-Release Watering Device: One unit of each size required.

1.7 INFORMATIONAL SUBMITTALS

A. Maintenance Recommendations: Recommended procedures to be established by Commissioner for care and protection of tree after completing the Work.

1. Submit before completing the Work.

B. Existing Conditions: Documentation of existing tree indicated to be transplanted, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.

1. Use sufficiently detailed color photographs or video recordings. Color will accurately depict hue condition of foliage and bark.
2. Include drawings and notations to indicate specific wounds and damage conditions of each tree designated to be transplanted.

C. Tree-maintenance reports.

1.8 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."

B. Tree-Service Firm Qualifications: An experienced landscaping contractor that has successfully completed transplanting work similar to that required for this Project.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or tree.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery with appropriate certificates.

C. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees in such a manner as to destroy their natural shape.

D. Completely cover foliage when transporting tree while in foliage.

E. Handle tree by root ball. Do not drop tree.

F. Move tree after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after moving, set tree in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1.10 FIELD CONDITIONS

A. Field Measurements: Verify final grade elevations and final locations of tree and construction contiguous with tree by field measurements before proceeding with transplanting work. Perform transplanting only after finish grades are established.

B. Seasonal Restrictions: Transplant tree during the following in-season periods:

1. Spring: May.
2. Fall: September.

C. Weather Limitations: Proceed with transplanting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Do not transplant during excessively wet or frozen conditions. Apply products during favorable weather conditions according to manufacturer's written instructions and guarantee requirements.

D. Coordination with Planting Beds: Perform transplanting before planting bedded areas unless otherwise indicated.

1. When transplanting after planting bedded areas, protect bedding plants, and promptly repair damage caused by transplanting operations.

1.11 GUARANTEE

A. Installer's Special Guarantee: Tree-service firm agrees to repair or replace trees and related materials that fail within specified guarantee period.

1. Failures include, but are not limited to, the following:

a. Death and unsatisfactory growth except for defects resulting from abuse, lack of adequate maintenance, or neglect by City of New York, or incidents that are beyond Contractor's control.
b. Death and unsatisfactory growth is defined as more than 25 percent dead or in an unhealthy condition or failure to meet general performance requirements at end of guarantee period.
c. Structural failures including tree falling or blowing over.
d. Faulty performance of materials and devices related to tree plantings including tree stabilization and watering devices.

2. Guarantee Periods from Date of Transplanting Completion:

a. Tree: 2 years.

3. Include the following remedial actions as a minimum:

a. Remove dead tree and tree with unsatisfactory growth at end of guarantee period; replace when directed.
b. A limit of one replacement of each tree will be required except for losses or replacements due to failure to comply with requirements.
c. Replace materials and devices related to tree plantings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Transplanted tree will be healthy and resume vigorous growth within one year of transplanting without dieback due to defective extracting, handling, planting, maintenance, or other defects in the Work.

2.2 PLANTING MATERIALS

A. Backfill Soil: Excavated soil mixed with planting soil of suitable moisture content and granular texture for placing and compacting in planting pit around tree, and free of stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.

1. Mixture: Well-blended mix of two parts excavated soil to one part planting soil.
2. Planting Soil: Planting soil as specified in Section 32 05 12 “Soils for Exterior Improvements”.

2.3 WATERING DEVICES

A. Watering Pipe: PVC pipe 4 inches in diameter, site-cut to length as required, and with snug-fitting removable cap.

2.4 MISCELLANEOUS PRODUCTS

A. Organic Mulch: Compost mulch as specified in Section 32 93 00 "Plants."

B. Burlap: Non-synthetic, biodegradable.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. For the record, prepare written report, listing conditions detrimental to transplanting work and tree protection and health.

B. Proceed with transplanting only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, other facilities, turf areas, and other plants and planting areas from damage caused by transplanting operations.

B. Locate and clearly identify tree for transplanting. Tie a 1-inch blue-vinyl tape around each tree at 54 inches above the ground.

C. Lay out transplant location. Stake locations, outline areas, adjust locations when requested, and obtain Commissioner's acceptance of layout before transplanting. Make minor adjustments as required.

D. Apply antidesiccant to tree uniformly, using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during extracting, handling, and transportation.

1. If deciduous trees are moved in full leaf, spray with antidesiccant before extracting and again two weeks after transplanting.

E. Wrap tree with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during extracting, handling, and transporting.

3.4 EXCAVATING PLANTING PITS

A. General: Excavate planting pits or trenches with sides sloping. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil. Scarify sides of planting pit smeared or smoothed during excavation.

1. Excavate approximately three times as wide as root ball.
2. Keep excavations covered or otherwise protected until replanting tree.

B. Subsoil and topsoil removed from excavations may be used as planting soil.

C. Obstructions: Notify Commissioner if unexpected rock or obstructions detrimental to tree are encountered in excavations.

D. Seepage: Notify Commissioner if subsoil conditions evidence unexpected water seepage into tree-planting pits.

E. Drainage: Fill planting pit or trench with 6 inches of water and time the infiltration rate of the soil. If the drainage rate is less than 0.25 inch per hour, notify Commissioner to determine need for subsurface drainage.

3.5 EXTRACTING TREE

A. Orientation Marking: Mark the north side of tree with non-permanent paint before extracting.

B. Root-Ball Width: Minimum 10 inches of root-ball diameter, or least dimension for non-round root balls, for each inch of tree caliper being transplanted.

C. Root-Ball Depth: As determined by the Commissioner for each species and size of tree and for site conditions at original and planting locations.

D. Digging:

1. Dig and clear a pit by hand to the depth of the root system. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
2. Use narrow-tine spading forks to comb soil to expose roots with minimal damage to root system.
3. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking.

4. Cut exposed roots manually with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not paint or apply sealants on cut root ends.
5. Temporarily support and protect exposed roots from damage until they are permanently redirected and covered with soil. Cover roots with burlap and keep them moist until planted.

3.6 PLANTING

A. Planting Standard: Perform planting according to ANSI A300 (Part 6) unless otherwise indicated.

B. Before planting, verify that root flare is visible at top of root ball. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

C. Ensure that root flare is visible after planting.

D. Orientation: Position the tree so that its north side, marked before extracting, is facing north in its new location.

E. Set tree plumb and in center of planting pit with bottom of root flare 2 inches above adjacent finish grades.

1. Use specified backfill soil mixed with planting soil for backfill.
2. If area under the tree was initially dug too deep, add backfill to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
3. After placing some backfill around root ball to stabilize plant, begin backfilling.
4. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
5. Redirect exposed root ends downward in backfill areas where possible. Hand-expose roots as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches back from new construction and as required for root pruning.
6. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended by arborist. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
7. Continue backfilling process. Water again after placing and tamping final layer of soil.

F. Watering Pipe: During backfilling, install watering pipe 4 feet deep into the planting pit outside the root ball as indicated on Drawings and with top of pipe 1 inch above the mulched surface.

G. Slopes: When planting on slopes, set the trees the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.7 MULCHING

A. Organic Mulch: Apply average thickness of organic mulch indicated on the Drawings, extending 12 inches beyond edge of individual planting pit and over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 6 inches of trunks or stems.

3.8 TREE MAINTENANCE

A. Maintain tree by pruning, cultivating, watering, weeding, fertilizing, mulching, and performing other operations as required to establish healthy, viable plantings. Treat as required to keep tree free of insects and disease.

B. Fill areas of soil subsidence with backfill soil. Replenish mulch materials damaged or lost in areas of subsidence.

3.9 REPAIR AND REPLACEMENT

A. General: Repair or replace transplanted tree and other plants indicated to remain or be relocated that are damaged by construction operations, in a manner recommended by the arborist and approved by Commissioner.

1. Submit details of proposed pruning and repairs.
2. Perform repairs of damaged trunks, branches, and roots within 24 hours according to arborist's written instructions.
3. Replace tree and other plants that cannot be repaired and restored to full-growth status, as determined by Commissioner.

B. Remove and replace tree that are more than 25 percent dead or in an unhealthy condition or are damaged during construction operations that Commissioner determines are incapable of restoring to normal growth pattern.

1. Provide new tree of same size as those being replaced for each tree of 4 inches or smaller in caliper size.
2. Species of Replacement Tree: Same species being replaced.

3.10 CLEANUP AND PROTECTION

A. During transplanting, keep adjacent paving and construction clean and work area in an orderly condition.

B. Protect tree from damage due to transplanting operations and operations of other trades. Maintain protection during transplanting and maintenance periods. Treat, repair, or replace damaged plantings.

C. After planting and before Substantial Completion Insert time, remove tags, markings, tie tape, labels, wire, burlap, and other debris from transplanted tree, planting areas, and Project site.

3.11 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Except for materials indicated to be recycled, remove surplus soil, excess excavated material, waste materials, displaced plants, trash, and debris, and legally dispose of them off City of New York's property.

B. Transport surplus satisfactory soil to designated storage areas on City of New York's property. Stockpile or spread soil as directed by Commissioner.

1. Except for materials indicated to be retained on City of New York's property or recycled, remove excess excavated material, waste materials, displaced plants, trash, and debris, and legally dispose of them off City of New York's property.

END OF SECTION 32 96 00

THIS PAGE INTENTIONALLY LEFT BLANK

FMS ID: **LQASADA**

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS

30-30 THOMSON AVENUE LONG ISLAND CITY, NEW YORK 11101-3045
TELEPHONE (718) 391-1000 WEBSITE www.nyc.gov/ddc

Department of Design and Construction

Contract for Furnishing all Labor and Material Necessary and Required for:

CONTRACT NO. 1 GENERAL CONSTRUCTION WORK

Astoria Branch Library Renovation

LOCATION: **14-01 Astoria Boulevard**
BOROUGH: **Queens, NY 11102**
CITY OF NEW YORK

Contractor

Dated _____ , 20 _____

Entered in the Comptroller's Office

First Assistant Bookkeeper

Dated _____ , 20 _____