



**Department of
Design and
Construction**

**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. One-page signed Bid Submission Form delivered in person to DDC before the bid due date; and
3. 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 deliver the certified check with the signed Bid Submission Form.

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

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

1. Any discrepancy between the total bid price listed on the Bid Submission Form and the bid information submitted in PASSPort.
2. Failure to upload required files or documents as part of a mandatory PASSPort Questionnaire response.
3. Uploading an incorrect file as part of a mandatory PASSPort Questionnaire response.
 - a. For clarity, this includes uploading the bid breakdown on a form other than the Excel file provided in the PASSPort Questionnaire.

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 should be submitted to the Agency Contact Person (CSB_projectinquiries@ddc.nyc.gov) at least five (5) business days (by 5:00 PM EST) prior to the bid opening date as indicated in the PASSPort procurement.

All PBQs must reference the Project ID. If a bidder has multiple PBQs for the same Project ID, the PBQs must be numbered sequentially, even if they are submitted separately.

While the PASSPort system has a facility for submitting inquiries, bidders are directed to send PBQs as directed above instead of using the PASSPort inquiry system.

Inquiries sent using the PASSPort inquiry system will not be considered PBQs.

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 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. 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 it 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)

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)

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)

CONTRACTOR'S SUMMARY OF BID BREAKDOWN FORM

Project ID: LNCA13HAM
Project Name: Hamilton Fish Park Library Renovation
Name of the Bidder: Lanmark Group, Inc.

CSI Division:	Total Cost
DIVISION 01 - GENERAL REQUIREMENTS	\$ 2,490,700.00
DIVISION 02 - EXISTING CONDITIONS	\$ 989,300.00
DIVISION 03 - CONCRETE	\$ 587,900.00
DIVISION 04 - MASONRY	\$ 205,400.00
DIVISION 05 - METALS	\$ 201,000.00
DIVISION 06 - WOOD, PLASTICS, COMPOSITES	\$ 983,700.00
DIVISION 07 - THERMAL AND MOISTURE PROTECTION	\$ 664,600.00
DIVISION 08 - OPENINGS	\$ 1,215,900.00
DIVISION 09 - FINISHES	\$ 1,887,200.00
DIVISION 10 - SPECIALTIES	\$ 197,500.00
DIVISION 11 - EQUIPMENT	\$ 902,200.00
DIVISION 12 - FURNISHINGS	\$ 117,100.00
DIVISION 13 - SPECIAL CONSTRUCTION	\$ -
DIVISION 14 - CONVEYING EQUIPMENT	\$ -
DIVISION 21 - FIRE SUPPRESSION	\$ -
DIVISION 22 - PLUMBING	\$ 751,100.00
DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)	\$ 1,122,300.00
DIVISION 25 - INTEGRATED AUTOMATION	\$ -
DIVISION 26 - ELECTRICAL	\$ 1,214,700.00
DIVISION 27 - COMMUNICATIONS	\$ -
DIVISION 28 - ELECTRONIC SAFETY AND SECURITY	\$ -
DIVISION 31 - EARTHWORK	\$ 60,800.00
DIVISION 32 - EXTERIOR IMPROVEMENTS	\$ 613,300.00
DIVISION 33 - UTILITIES	\$ -
DIVISION 34 - TRANSPORTATION	\$ -
DIVISION 35 - WATERWAY AND MARINE CONSTRUCTION	\$ -
DIVISION 40 - PROCESS INTEGRATION	\$ -
DIVISION 41 - MATERIAL PROCESSING AND HANDLING EQUIPMENT	\$ -
DIVISION 42 - PROCESS HEATING, COOLING, AND DRYING EQUIPMENT	\$ -
DIVISION 43 - PROCESS GAS AND LIQUID HANDLING, PURIFICATION AND STORAGE EQUIPMENT	\$ -
DIVISION 44 - POLLUTION AND WASTE CONTROL EQUIPMENT	\$ -
DIVISION 45 - INDUSTRY-SPECIFIC MANUFACTURING EQUIPMENT	\$ -
DIVISION 46 - WATER AND WASTEWATER EQUIPMENT	\$ -
DIVISION 48 - ELECTRICAL POWER GENERATION	\$ -
Total Cost Summary (Including General Requirements):	\$ 14,204,700.00

Note : Ignore CSI divisions that do not apply to this project

BID SUBMISSION FORM

Bidder Name: Lanmark Group, Inc.
Procurement Title: 85023B0027-LNCA13HAM Hamilton Fish Park
Library Renovation (Large GC PQL)
RFx Name: 85023B0027-LNCA13HAM Hamilton Fish Park
Library Renovation (Large GC PQL)

The above-named bidder affirms and declares:

1. The bidder has completed and submitted all required information for the above procurement in the PASSPort system;
2. Any discrepancy between the bid price listed on this Bid Submission Form and the bid information submitted in PASSPort may result in the agency finding the bid non-responsive; and
3. This bid is being submitted in accordance with New York State General Municipal Law § 103.

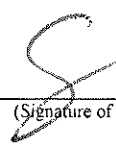
Lump Sum Bid Amount
(Bid Price Item Grid) \$ 14,204,700.00
+ All Allowances
(Allowances Item Grid) \$ 554,270.00

= Total Bid Price:
(a/k/a Total Amount) \$ 14,758,970.00

Bidder Signature

EIN (if applicable): 20-4557644
(EIN must match the EIN of the entity that submitted bid information in PASSPort)

Bidder Name: Lanmark Group, Inc.
George Manouselakis
(Name of Partner or Corporate Officer)

By: 
Signature: (Signature of Partner or Corporate Officer)

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)
Bronx Hall of Justice - Remediation - Bid Package 2 Bronx, NY	Prime	\$11,592,477.53	12/2022	NYC DDC Larry Shim (646) 772-6191	Rafael Vinoly Architects Dennis Goudas (646) 807-6994
Flushing Community Library - GC Support Scope For Library Temp. Heat & Cool, Flushing, NY	Prime	\$60,096.96	2/2022	QPL John Katimaris 718-480-4260	Not Applicable
PS 209 (X) Bronx, NY	Prime	\$1,985,552.09	2/2022	NYC SCA William Coyle (917) 440-6235	CTA Architects P.C. Frank A. Szatkowski (212) 243-7404
Bronx Hall of Justice - Post Construction Work Bronx, NY	Prime	\$18,819,205.66	9/2021	NYC DDC Larry Shim (646) 772-6191	Rafael Vinoly Architects Dennis Goudas (646) 807-6994
Senior Center Upgrade at Vladeck Houses New York, NY	Prime	\$2,169,483.22	9/2020	NYCHA Ajay Muraleedharan (347) 833-7547	NYCHA Kristine Wolf (212) 306-2993
Tottenville High School COVID-19 Testing Facility Staten Island, NY	Prime	\$268,412.10	8/2020	Armand Corporation Shamsell Abdill (212) 542-4179 x41	Not Applicable
Community Center Renovation - Phase II at Fulton Houses New York, NY	Prime	\$2,134,590.02	5/2020	NYCHA Ajay Muraleedharan (347) 833-7547	NYCHA Simone Bridgeforth (212) 306-7940

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)
Flushing Community Branch Library Flushing, NY	Prime	\$6,403,581.82	\$2,677,202	\$3,709,317.88	3/2024	NYC DDC Carlos Rodriguez (347) 749-3145	Spacesmith Amy Jarvis (212) 620-5583
WTC Work Order 39 - Liberty Park Finishes - St. Nicholas Church, New York, NY	Prime	\$4,905,976.38	\$2,944,506	\$237,428	8/2023	WTC Capital Projects Mourad Rahman (917) 567-5196	AECOM Thomas Kyd (516) 417-2854
Young Women Leadership School of Astoria Astoria, NY	Prime	\$3,310,667.91	\$1,722,100	\$399,875.81	4/2023	NYC SCA Gary Huang (347) 924-7957	SBLM Architects Oriel Mor (212) 995-5600

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)
York College Performing Arts Center Interior Upgrade Jamaica, NY	Prime	\$15,325,000	3/16/23	DASNY Daria Khanafiev (518) 257-3707	EwingCole (212) 354-5656
Poppenhusen Institute Window and Facade Restoration College Point, NY	Prime	\$4,482,071	TBD (March/April 2023)	NYC DDC Chinwee Summors (718) 391-1004	CTA Architects P.C. (212) 243-7404



Firm Background

Lanmark Group, Inc. was formed in 2005 as part of the continuing efforts of the Beys family of companies, including Beys Contracting, Inc. and Beys General Construction Corp., to better serve the construction industry. Lanmark has become known as a highly-qualified general contractor that takes pride in its superior safety and quality control procedures. With LEED-Accredited professionals available, Lanmark invests in green building practices adding greater value to the project and to our environment.

Mr. Eleftherios Kougentakis, president and owner of Lanmark, has over 35 years of experience in the construction industry and as an owner/officer for 30 of those years, managed general construction projects with an aggregate value in excess of \$420 million (see Mr. Kougentakis' resume attached). Over the years, as an officer of Beys and Lanmark, Mr. Kougentakis has developed expertise and acquired experience in dealing with unique and complex multi-discipline projects involving the restoration and preservation of historical facades, renovation of school and hospital interiors/exterior, installation of elevators and escalators, as well as numerous projects involving virtually every aspect of construction from foundations to roofing, including HVAC infrastructure projects. The majority of these projects were around operating facilities.

Lanmark is insured by Travelers and bonded by Liberty Mutual Insurance Company and has a \$25,000,000 Single/\$75,000,000 Aggregate. Within thirteen years, Lanmark has completed a wide variety of projects valuing over \$220 Million aggregate. The key to our outstanding success is based on the "Total Project Team" concept of using talented specialists in all areas of construction integrated with a family of experienced subcontractors. The composition of the "Construction Team", tailored and assembled for each project, is given very careful consideration. The objective is always to provide the owner with a strong and experienced unit that is knowledgeable in the planning, coordination, execution, evaluation, and remedial design measures during construction. We use the expertise of highly experienced safety engineers to ensure that we comply with or surpass all OSHA regulations. Our trained quality control personnel are committed to delivering projects that meet contract requirements and customer expectations every time.

Lanmark Group has successfully undertaken and completed work on a variety of construction projects for various State and Municipal agencies, including the Dormitory Authority of the State of New York, Port Authority of New York and New Jersey, New York City School Construction Authority, New York City Department of Design and Construction, New York City Departments of Corrections, New York City Transit Authority and Long Island Railroad.

Lanmark is an Equal Opportunity Employer and is committed to meeting the MBE/WBE/LBE/DBE/SDVOB targets on all of its contracts.

BUILDING POSSIBILITIES



March 6, 2023

Anika Barrington
New York City Department of Design and Construction
30-30 Thomson Avenue
Long Island City, NY 11101

**Re: FMS ID # LNCA13HAM – Hamilton Fish Park Library Renovation
Resumes**

Dear Anika Barrington:

The following key personnel are expected to be utilized on the project.

- Eleftherios Kougentakis – President
- George Manouselakis – Corporate Secretary
- Gregory Kougentakis – Vice President,
- Stavros Karanikolas – Proposed Project Manager
- Vincent Losito – Proposed Project Superintendent

If you have any questions, please feel free to contact the undersigned.

Thank You,

A handwritten signature in blue ink, appearing to be 'G. Manouselakis', is written over the printed name.

George Manouselakis
Corporate Secretary

BUILDING POSSIBILITIES

SENIOR EXECUTIVE SUMMARY

President

Over 35 years of construction project management experience spanning all phases of construction. Successfully undertaken and completed work on a variety of construction projects for numerous Federal, State and Municipal agencies including:

- Dormitory Authority of the State of New York
- New York City Transit Authority
- Army Corp of Engineers
- New York City Economic Development Corporation
- New York State Office of General Services
- United States Navy
- Port Authority of New York and New Jersey
- New York City School of Construction Authority
- New York City Department of Design and Construction
- New York City Health and Hospital Corporation
- United States Postal Service
- New York State Department of Transportation
- Department of Citywide Administrative Services
- United States Department of Interior

Developed exceptional expertise and experience in dealing with unique and complex multi-discipline projects involving the restoration and preservation of historical facades, renovation of school and hospital interiors/exterior, installation of elevators and escalators, as well as numerous projects involving virtually every aspect of construction from foundations to roofing, including HVAC infrastructure projects. Managed construction projects with an aggregate value in excess of \$420 million.

PROFESSIONAL EXPERIENCE

LANMARK GROUP, INC. Brooklyn, NY

President and 100% Shareholder (2005 - Present)

Responsible for the overall success of the company.

- Developing the company's strategy in pursuit of construction projects in both the public and private sectors.
- Leading and building the senior management and the rest of the organization to create an efficient and organized general construction environment.
- Preparing senior management to follow a developed system in successfully executing and completing construction projects, in which senior management can successfully cultivate future Lanmark employees.
- Allocating company's capital in the direction best suited for Lanmark's overall company success.

BEYS GENERAL CONSTRUCTION CORP. Brooklyn, NY

Secretary and 50 % Shareholder (2004 - 2011)

Serves as a focal point for communication with various state and city departments. Administrator of critical corporate matters. Responsible for managing the day-to-day activities of the company. Monitoring the daily operations of all construction projects, ensuring that the projects are progressing effectively and on schedule. Responsible for the design, operation and improvement of the current construction management system.

BEYS CONTRACTING, INC. Brooklyn, NY

Vice President and 33-1/3% Shareholder (1993 - 2010)

Function has been primarily in the overseeing of projects involving Dormitory Authority of the State of New York (DASNY) excess of \$190 million throughout the New York Metro area. Projects consisting of interior and exterior restoration and modernization.

BEYS SPECIALTY CONTRACTING, INC. Brooklyn, NY

Vice President (1987 – 1993)

IBM Poughkeepsie, NY

Computer analyst (1985- 1987)

BEYS SPECIALTY CONTRACTING, INC. Brooklyn, NY

Construction Superintendent (1983 – 1985)

EDUCATION

City College of New York, Manhattan, NY

Master Degree, in Computer Science

City College of New York, Manhattan, NY

Bachelor of Science, in Computer Science

George Manouselakis
2270 East 73rd Street
Brooklyn, NY 11234
(917) 417-5024
gmanouselakis@lanmarkgc.com

Work Experience

Lanmark Group, Inc.

- 2005 - Present **Position:** Corporate Secretary/Procurement Officer
 Responsibilities:
 - Manage Estimating Department Activities
 - Procurement of subcontractors and negotiation of terms and contract price
 - Manage numerous project managers on various projects throughout New York City

Beys General Construction Corp.

- 2004 – 2006 **Position:** Project Manager
 Responsibilities:
 - Manage numerous superintendents on various projects throughout New York City
 - Draft and negotiate all change orders and delay claims and accompanying support materials
 - Prepare Primavera CPM schedules
 - Procurement of subcontractors and negotiation of terms and contract price
 - Coordinate subcontractor activities
 - Prepare necessary documentation, e.g. submittals, payment requisitions, requests for information, etc.

Beys Contracting, Inc.

- 1998 – 2004 **Position:** Project Superintendent
 Responsibilities:
 - Responsible for all phases of construction activities
 - Coordination of all trades, including preparation of Primavera CPM schedules
 - Draft all project change orders
 - Review subcontractor shop drawings and submittals for compliance with contract drawings & specs
 - Prepare necessary documentation, e.g. submittals, payment requisitions, requests for information, etc.

Computer Skills

Internet, Hardware, Networking, Microsoft Dos, Windows, Microsoft Office, Microsoft Project, Word Perfect, Lotus 123, Norton Utilities, Norton Antivirus, McAfee Antivirus, Mac OS, C++, Visual Basic, VectorWorks, Adobe Photoshop, Primavera P3 Project Planner, Expedition, Autocad

Education

Fordham University, New York, NY
M.B.A., Graduate School of Business Administration
May, 2003
Concentration: Communication and Information Systems; G.P.A. 4.0

Fordham University, Bronx, NY
B.S., College of Business Administration
December, 2001
Concentration: Information Systems; Secondary Concentration: Management; G.P.A. 3.75

Achievements

Earned 100% of undergraduate and graduate expenses
Completed undergraduate education in 3 ½ years
Completed graduate education in 1 year

Honors

- 1998 - 2001 Dean's List at College of Business Administration, Fordham University
- February 2001 Inducted member of Beta Gamma Sigma, Business Honor Society
- February 2001 Inducted member of Fordham University Boyle Society, Honor Society
- February 2002 Inducted member of Phi Kappa Phi, Economics Honor Society
- 2002 - 2003 Dean's List at Graduate School of Business Administration, Fordham University

Special Achievements

- February 1998 Attained the coveted rank of Eagle Scout

References Available Upon Request

Gregory Kougentakis

11 Roslyn Drive, Glen Head, NY 11545 / gkougentakis@lanmarkgc.com / 646-533-1581

Introduction:

I began working in the construction field as an Assistant Estimator and through the years, worked my way up to becoming an Estimator, Super, Project Manager, and Senior Project Manager. While at Lanmark Group, I learned to read/analyze drawings and began to encounter all different aspects that go into construction projects. Through my hard work and advancement from different positions, I am able to understand, prepare, coordinate and complete projects in their entirety in a timely manner and within budget.

Professional Experience:

Lanmark Group, Inc.

Vice President

November 2021 - Present

- Oversee operation of company on all projects.
- Ensure that all safety and quality protocols are implemented onsite.
- Oversee Project Managers and Superintendents to ensure work is performed timely and to the satisfaction of the owner.
- Ensure proper coordination is achieved between Lanmark and Subcontractors.
- Manage all financial aspects of projects.
- Liaison between Company and Owner, as well as between Company and Subcontractors

Lanmark Group, Inc.

Senior Project Manager

March 2019 – October 2021

- Create necessary schedule updates to show progress of work
- Manage all financial aspects of projects
- Manage all aspects of work being conducted on projects
- Liaison between Company and Owner, as well as between Company and Subcontractors

Lanmark Group, Inc.

Project Manager

January 2014 – February 2019

- Create necessary schedule updates to show progress of work
- Manage all financial aspects of projects
- Manage all aspects of work being conducted on projects
- Liaison between Company and Owner, as well as between Company and Subcontractors

Lanmark Group, Inc.

Superintendent

January 2012 – December 2013

- Implement safety for all personnel on the project
- Schedule and coordinate subcontractors for completion of project in a timely manner
- Create submittals for products used
- Review shop drawings submitted by each subcontractor
- Coordinate all necessary inspections, as required
- Documentation of work being conducted and necessary safety lists

Lanmark Group, Inc.

Estimator

September 2009 - January 2012

- Read drawings and understand specifications and all necessary work depicted
- Divide project work for various subcontractors
- Contact subcontractors for pricing
- Acquire pricing for current construction projects

Lanmark Group, Inc.

Assistant Estimator

December 2006 – September 2009

- Contact subcontractors for pricing
- Acquire pricing for current construction projects

Certifications:

Site Safety Training Supervisor
 OSHA 30-Hour Construction Safety and Health
 32-Hour Supported Scaffold Installer/Erector
 Lead Awareness
 Confined Space

Education:

Pace University – New York, NY
 Bachelor's Degree in Business Management

Projects and Areas of Experience:

Flushing Community Library – Construction of Second Elevator (Flushing, NY) - NYC Department of Design & Construction - \$5.9M

Vice President

- Installation of new elevator.
- New glass and aluminum paneled curtain wall system.
- Demolition and reinforcements of concrete slabs.
- Structural steel installation.
- Decorative millwork ceiling installation.

Bronx Hall of Justice - Remediation Bid Package 2 (Bronx, NY) - NYC Department of Design & Construction - \$11.2M

Senior Project Manager

- Correcting HVAC airflow issues throughout the occupied courthouse
- Install various fire dampers and fire smoke dampers
- Provide and install new dry coolers mounted on new dunnage
- Install new exhaust & makeup air system to provide a mechanical means of heat removal from the engine exhaust shaft
- Removal of excess heat from courtroom A/V closets
- Modify curtainwall shadow box to allow proper heat transfer
- Provide new feeder to correct water penetration through underground conduits
- Replaced 60" wide by 170" high ½" interior glass tempered partitions
- Supporting plumbing work, electrical work, and the restoration of affected finishes.

Bronx Hall of Justice - Post Construction Work (Bronx, NY) - NYC Department of Design & Construction - \$17.4M

Senior Project Manager

- Remove and replace defective intumescent paint throughout the building
- Remove and replace lead coated copper roofing, gutters and flashing at lobby ramp roof
- Remove, repair and replace defective waterproofing at plaza areas over garage including concrete topping, stairs, landscaping, and electrical
- Replace house sewer and plumbing vent pipes
- Remove and replace damaged ductwork in garage
- Provide balancing valves to HW and AHU systems.

Community Center Renovation - Phase II at Fulton Houses (NY, NY) - NYC Housing Authority - \$2M

Senior Project Manager

- Gut renovation of the south side of the Fulton Houses Community Center.
- Asbestos abatement and demolition of existing finishes.
- Installation of new walls, doors, ceilings, floors, and painting throughout.
- Minor plumbing work, new split type air conditioning units with associated piping and ductwork, convector covers, and new communication, power, and lighting.

Senior Center Upgrade at Vladeck Houses (NY, NY) - NYC Housing Authority - \$2.1M

Senior Project Manager

- Gut renovation of the kitchen and four bathrooms.
- Asbestos/lead abatement and demolition of existing flooring, walls and finishes.
- Installation of new concrete slabs, CMU walls, railing, hollow metal doors and hardware, counter coiling door, window, ceramic tiles, resilient flooring, painting, signs, food service equipment, plumbing, HVAC, and electrical.
- Installation of a new fire alarm system.

WTC - Work Order #15 (NY, NY) - Port Authority of New York and New Jersey - \$1M

Project Manager

- Installation of fire wrap at existing ductwork
- Design, furnish, and install a 2-hour rated enclosure around two (2) each floor mounted stair pressurization fans (SF14 & SF15) and two (2) each hung fans (SF13 & SF16) supply fans.
- Rework chilled work supply and return piping at fan coil unit.

WTC Transportation Hub - Architectural Finishes (NY, NY) - Port Authority of New York and New Jersey - \$13M

Project Manager

- Waterproofing
- Insulation
- Temporary roofing
- Finish flooring
- Painting
- Installation of monorails, glass doors, concrete pads & topping slabs, coiling doors

AMKC Emergency Roof Remediation (Rikers Island, NY) - NYC Department of Correction - \$1.1M

Project Manager

- This job required the removal and replacement of the existing roofing system and bricks at specified building locations. Roof railings were also installed and brick pinning was performed at specific areas.

General Requirements Contract West (Rikers Island, NY) - NYC Department of Correction - \$1M

Project Manager

- This was a multiple task order general requirements contract. Work included but was not limited to: masonry, structural steel, interior finishes, security doors and frames, roofing, plaster, painting, excavation, site work and concrete work.

General Requirements Contract East (Rikers Island, NY) - NYC Department of Correction - \$1M

Project Manager

- This was a multiple task order general requirements contract. Work included but was not limited to: masonry, structural steel, interior finishes, security doors and frames, roofing, plaster, painting, excavation, site work and concrete work.

PS 204 (Brooklyn, NY) - NYC School Construction Authority - \$17.3M

Superintendent/Project Manager

- Masonry pointing and replacement
- GFRC installation
- Steel installation
- Window reinstallation
- Complete roof replacement
- Concrete replacement
- Plumbing, HVAC and electrical
- Complete bathroom renovation

PS 61 (NY, NY) - NYC School Construction Authority - \$8.8M

Superintendent/Project Manager

- Masonry pointing and replacement
- Patching of existing roof
- New ventilator installation
- New window and guard installation.
- Lintel and Steel replacement
- Interior finishes

PS 17 (Brooklyn, NY) - NYC School Construction Authority - \$8.9M

Superintendent

- Masonry and roofing replacement
- Installation and testing of new windows
- Installation of new window guards
- Hot water heater installation
- Drainage tank installation

New Kensington Branch Library (Brooklyn, NY) - NYC Department of Design and Construction - \$9.5M

Superintendent

- Excavation, including underpinning of adjacent buildings
- Concrete foundation

- Erecting of structural steel
- Interior finishes including custom stainless steel staircase, flooring, millwork including shelving and wall panels, bathroom and finish tile work, glass railings
- Exterior structural steel glass canopy
- Marble bench with flag pole
- Exterior concrete sidewalk and pavers

STAVROS KARANIKOLAS

PROFESSIONAL EXPERIENCE

Oct. 2020 – Present Lanmark Group, Inc. Brooklyn, NY

Sr. Project Manager

- WTC Liberty Park Finishes St. Nicholas Church New York, NY – Contract \$4.2 M
- Flushing Community Branch Library Elevator Addition Flushing, NY – Contract \$6.4 M

Oct. 2019 – Oct. 2020 XBR, Inc. Astoria, NY

Sr. Project Manager

- Small & Medium PQL Renovation Projects for the DDC's NYPL & Cultural Programs Units

2008 - Oct. 2019 T.A. Ahern Contractors Corp. Woodside, NY

Scheduling & Analysis/ Chief Estimator/ Sr. Project Manager

- Addition/ Renovation; P.S. 163 Queens, NY – Contract \$44 M
- Addition/ Renovation; P.S. 92 Queens, NY – Contract \$47 M
- Tenant Fit-Out; I.S. 611 Brooklyn, NY – Contract \$33 M
- Tenant Fit-Out; P.S. 311 Bronx, NY – Contract \$10 M
- Demolition/ New Construction; P.S. 287/330 Queens, NY- Contract \$37 M
- New Construction; P.S. 665/ 163 Brooklyn, NY – Contract \$60 M
- Demolition/ New Construction; I.S. 263 New York, NY- Contract \$51 M
- Addition/ Renovation; P.S. 102 Queens, NY – Contract \$57 M
- Tenant Fit-Out; Hunter College Roosevelt House New York, NY – GC Prime Contract \$13 M
- Addition/ Renovation; New Utrecht H.S. Brooklyn, NY – Contract \$31 M
- Renovation; Samuel Gompers H.S. Bronx, NY – Contract \$30 M

2007 - 2008 AMCC Corporation Long Island City, NY

Scheduling & Analysis/ Sr. Project Manager

- Design/ Build; P.S. 48 Queens, NY – Contract \$53 M
- Design/ Build; P.S. 128 Queens, NY – Contract \$50 M
- New Construction; P.S. 237 Brooklyn, NY — Contract \$57 M
- New Construction; Bronx Studio School for Artists & Writers Bronx, NY – Contract \$47 M
- Renovation; P.S. 229/ 230 Bronx, NY – Contract \$11 M
- New Construction; P.S. 245 Queens, NY – Contract \$25 M
- Addition/ Renovation; P.S. 829 Staten Island, NY – Contract \$23 M
- Addition/ Renovation; P.S. 89 Brooklyn, NY – Contract \$34 M

2005 - 2007 Hunter Roberts Construction Group, LLC New York, NY

Scheduling & Analysis

- New Construction; P.S. 263 Jamaica, NY – Contract \$39 M
- New Construction; P.S. 260 Corona, NY – Contract \$41 M

Project Manager

- Renovation; Harry S Truman HS Science Lab Upgrade Bronx, NY – Contract \$3.5 M
- Tenant Fit-Out; P.S. 234/ Annex New York, NY – Contract \$4 M
- Addition/ Renovation; Jet Systems Aviat - Hangar “E”, Westchester County Airport White Plains, NY – Contract \$8 M

2002 - 2005 Beys Contracting, Inc.

Brooklyn, NY

Project Manager

- Renovation; Port Authority Trans-Hudson Corporation New York & New Jersey Facilities Building and Site Improvements Via Work Order – Contract \$10 M
- Renovation; Brooklyn Central Library Reconstruction of Entrance Plaza & New Auditorium Brooklyn, NY – GC Prime Contract \$9 M
- New Construction; Bellevue Hospital Center New Ambulatory Care Facility New York, NY – GC & Masonry Prime Contracts \$30 M
- Renovation; George Washington Bridge & Palisades Interstate Parkway Toll Both Replacement Fort Lee, NJ – Contract \$6 M

1997 - 2002 Karnikk Construction, Corp.

Bayside, NY

Owner/ Operator

- Responsible for General Management, Estimating & Project Management. Most notable contract: US Army Corps of Engineers, building renovation project, Brooklyn, NY — Contract \$2.5 M

1991 – 1997 Trataros Construction, Inc.

Brooklyn, NY

Closeout Project Manager

- New Construction; PS 24 Brooklyn, NY — Contract \$23 M

Project Superintendent

- New Construction; Marcy Correctional Facility Utica, NY – GC Prime Contract \$7.5 M
- Plaza Renovation & Structural Repairs; Jacob K. Javits Federal Office Building and US Court of International Trade New York, NY – Contract \$9 M

Construction Cost Estimator

- Prepared construction cost estimates for Federal, State and City new construction and renovation projects.

EDUCATION

1990-91 New York University

New York, NY

Diploma in Building Construction Management

1988-90 Queens College, CUNY

Flushing, NY

Some college coursework completed

APPLICATIONS

MS Office/ Project, CMiC, Expedition, P6



VINCENT LOSITO

vmlosito@yahoo.com | (716) 969-1159 | LAKE RONKONKOMA, NY 11779

Summary

Responsive Project Superintendent promoting an 9-year career demonstrating positive safety measures to staff and subcontractors. A focused leader with a pleasant demeanor and committed to regular site inspections. Ready for a new position overseeing projects for a commercial builder. An enthusiastic individual with a strong knowledge of construction protocols and standards. Composed and driven with great communication skills.

Skills

- Deadline management
- Concrete estimation
- Staff training and mentoring
- Site safety coordinator
- Building codes and regulations
- Subcontractor scheduling and supervision
- Safety procedures
- Coordinated project operations
- Site inspections
- Renovations, building and demolition
- OSHA safety requirements

Experience

Lanmark Group Inc | Brooklyn, NY
Project Superintendent
03/2022 - Current

- Notable Project: Flushing Library Elevator Addition - \$6M (demo existing finishes & MEP, excavation & concrete, existing bldg structural reinforcement prior to removal of concrete slabs for elevator shaft) NYC DDC
- Coordinate and supervise all day-to-day field construction operations, order material and inspections, including enforcing subcontractors preparedness prior to their SOW to maintain project schedule Maintain construction schedule, identifies and solves problems
- Supervise personnel in the field for both safety and quality control

Dobco Inc | Wayne, NJ
Project Superintendent
02/2021 - 02/2022

- Notable Project: PS434 - \$47.4M (MEP, framing, precast panel installation, & interior finishes), NYC Construction Authority – New Addition Building & Existing Building Alterations
- Experienced with NYCSCA, DOB, DOT, & EPA procedures and protocol
- Excellent communicator with both client, subcontractors and main office
- Coordinate all subcontractors' responsibilities to adhere to the schedule
- Coordinate and supervise all day-to-day field construction operations
- Maintain construction schedule, identifies and solves problems
- Reinforce all safety and quality issues for work in progress
- Maintains an organized job site, including the construction office
- Order materials in advance of needing, and inspection requests
- Supervises the completion of punch list

MPCC Corp | New Rochelle, NY
Site Superintendent
01/2018 - 01/2021

- Notable Projects: PS002 - \$29.7M (MEP, structural steel, & precast panel installation), NYC Construction Authority – New Addition Building & Existing Building Alterations
- PS066- \$27.4M (demo through closeout)
- Maintained daily communication with subcontractors and inspectors to drive forward progress of project.
- Interpreted blueprints and plans and relayed information to team of workers Worked closely with project management team to maintain and negotiate site related engineering changes

A&E Real Estate | New York, NY

Project Superintendent

10/2014 - 12/2017

- Notable Project: 245 E 80th St, Manhattan, NY - \$20M (complete renovation of 12 story building)

Island International Inc | Calverton, NY

Foreman

08/2013 - 10/2014

- Notable Project: City Point Tower (fabricate curtain walls)

Education and Training

SUNY Fredonia

Bachelors of Arts

Accomplishments

- CERTIFICATIONS:
- DOB Registered Construction Superintendent, Construction Health & Safety Technician (CHST) 30-Hour OSHA, 62-Hour SST supervisor, Construction Fire Safety Manager (CFSM) 4-Hour supported scaffold user, 8-Hour Site Safety Coordinator
- NYFD COF: S56, F60, G44, S93, S94



March 6, 2023

Anika Barrington
New York City Department of Design and Construction
30-30 Thomson Avenue
Long Island City, NY 11101

**Re: FMS ID # LNCA13HAM – Hamilton Fish Park Library Renovation
Equipment**

Dear Anika Barrington:

The project is primarily interior renovation work with some exterior site work. The project will require the use of hand tools and equipment that will be rented from Sunbelt Rentals.

If you have any questions, please feel free to contact the undersigned.

Thank You,

A handwritten signature in blue ink, appearing to read "G. Manouselakis", is written over the printed name.

George Manouselakis
Corporate Secretary

BUILDING POSSIBILITIES

2125 Mill Avenue | Brooklyn, NY 11234 | [Tel 347.462.4000](tel:347.462.4000) | [Fax 347.462.4001](tel:347.462.4001) | [Web lanmarkgc.com](http://lanmarkgc.com)



March 6, 2023

Anika Barrington
New York City Department of Design and Construction
30-30 Thomson Avenue
Long Island City, NY 11101

**Re: FMS ID # LNCA13HAM – Hamilton Fish Park Library Renovation
Subcontracted Work**

Dear Anika Barrington:

The following work is expected to be subcontracted:

- Sidewalk Shed/Scaffolding
- Site Maintenance
- Demolition
- Asbestos Abatement
- Masonry
- Steel
- Millwork
- Roofing
- Glazing
- Ceramic Tiles
- Flooring
- Painting
- Signage
- Window Shades
- Plumbing – Hepco Heating & Plumbing
- HVAC – Trax Mechanical
- Electrical – Raikos Electric
- Concrete and Sitework
- Unit Paving
- Irrigation & Landscaping

At this time, only the plumbing, HVAC, and electrical subcontractors are known and are provided.

If you have any questions, please feel free to contact the undersigned.

Thank You,

A handwritten signature in blue ink, appearing to read 'G. Manouselakis', is written over the printed name.

George Manouselakis
Corporate Secretary

BUILDING POSSIBILITIES



March 6, 2023

Anika Barrington
New York City Department of Design and Construction
30-30 Thomson Avenue
Long Island City, NY 11101

**Re: FMS ID # LNCA13HAM – Hamilton Fish Park Library Renovation
Key Material Suppliers**

Dear Anika Barrington:

The following are the anticipated key material suppliers for the project:

- Proprietary Items for specification sections 087100, 230900, 281000, 281400, 282100, 282300, 284600, will be supplied by the vendors specified in the specifications.
- General building materials will be supplied by Kamco Supply Corp. or Park Avenue Building & Roofing LLC.
- The concrete will be supplied by a concrete plant with the proper experience.
- The cast stone will be supplied by a fabricator with the proper experience.
- The masonry materials will be supplied by Glenwood Mason Supply.
- The steel materials will be supplied by a fabricator with the proper experience.
- The interior architectural woodwork and solid surfacing will be supplied by a fabricator with the proper experience.
- The doors and door hardware will be supplied by one of the approved manufacturers listed in the specifications.
- The aluminum-framed entrances and storefronts, all-glass entrances and storefronts, glazed aluminum curtain walls will be supplied by one of the approved manufacturers listed in the specifications.
- The direct-applied acoustical ceilings will be supplied by one of the approved manufacturers listed in the specifications.
- The baffle ceiling panels will be supplied by one of the approved manufacturers listed in the specifications.
- The fixed sound-absorptive panels will be supplied by a fabricator with the proper experience.
- The paint will be supplied by one of the approved manufacturers listed in the specifications.
- The signs will be supplied by a fabricator with the proper experience.
- The demountable partitions will be supplied by one of the approved manufacturers listed in the specifications.
- The toilet accessories will be supplied by one of the approved manufacturers listed in the specifications.
- The fire protection cabinets will be supplied by one of the approved manufacturers listed in the specifications.

BUILDING POSSIBILITIES



- The flag pole will be supplied by one of the approved manufacturers listed in the specifications.
- The library stack system will be supplied by one of the approved manufacturers listed in the specifications.
- The projection screen will be supplied by one of the approved manufacturers listed in the specifications.
- The curtain and drapes will be supplied by one of the approved manufacturers listed in the specifications.
- The window shades will be supplied by one of the approved manufacturers listed in the specifications.
- The entrance floor mat will be supplied by one of the approved manufacturers listed in the specifications.
- The plumbing materials will be supplied by Bruce Plumbing Supply and Ferguson.
- The HVAC materials will be supplied by Abco/Daikin, ADE/Mechanical Technologies, Abco Supply, and Artisan Sheet Metal.
- The electrical materials will be supplied by Benfield Electrical Supply, G& G Electrical Supply, JT Roselle Lighting, and JPR Lighting
- The soils and fill will be supplied by a supplier with the proper experience.
- The precast concrete unit pavers will be supplied by one of the approved manufacturers listed in the specifications.
- The irrigation will be supplied by one of the approved manufacturers listed in the specifications.
- The plants will be supplied by a nursery with the proper experience.

If you have any questions, please feel free to contact the undersigned.

Thank You,

A handwritten signature in blue ink, appearing to read "George Manouselakis", is written over the printed name.

George Manouselakis
Corporate Secretary

BUILDING POSSIBILITIES

ID	Task Name	Duration	Start	Finish	Predecessors	Jul 23, '23	T	S	W	Sep 17, '23	S	T	M	F	T	S	W	Mar 3, '24	S	T	M	F	T	S	W	Jun 23, '24	T	S	W	Aug 18, '24	S	T	M	F	T	S	W	Dec 8, '24	T	S	W	Feb 2, '25	S	T	M	F	T	S	W	Mar 30, '25	T	M	F	T	S	W	May 25, '25	T	S	W	Jul 20, '25	S	T	M	Sep 14, '25	T	M
0	Hamilton Fish Park Preliminary Schedule	515 days	Mon 10/2/23	Fri 9/19/25																																																															
1	General Requirements	200 days	Mon 10/2/23	Fri 7/5/24																																																															
2	Notice to Proceed	0 days	Mon 10/2/23	Mon 10/2/23																																																															
3	Subcontractor Procurement	20 days	Mon 10/2/23	Fri 10/27/23	2																																																														
4	Subcontractor Approval	20 days	Mon 10/30/23	Fri 11/24/23	3																																																														
5	Submittals and Shop Drawings	40 days	Mon 11/27/23	Fri 1/19/24	4																																																														
6	Approvals of Submittals and Shop Drawings	20 days	Mon 1/22/24	Fri 2/16/24	5																																																														
7	Fabrication and Delivery	100 days	Mon 2/19/24	Fri 7/5/24	6																																																														
8	Mobilization	5 days	Mon 2/19/24	Fri 2/23/24	6																																																														
9	Interior Construction	390 days	Mon 2/26/24	Fri 8/22/25																																																															
10	Temporary Partitions	5 days	Mon 2/26/24	Fri 3/1/24	8																																																														
11	Asbestos Abatement	20 days	Mon 3/4/24	Fri 3/29/24	10																																																														
12	MEP Disconnects & Removals	10 days	Mon 4/1/24	Fri 4/12/24	11																																																														
13	Demolition @ 1st Flr & Mezzanine	40 days	Mon 4/15/24	Fri 6/7/24	12																																																														
14	Sawcut, Remove Slabs, & Excavate	10 days	Mon 6/10/24	Fri 6/21/24	13																																																														
15	Underslab Plumbing/Electrical Pipes/Boxes	10 days	Mon 6/24/24	Fri 7/5/24	14																																																														
16	Grade Beams/ Concrete Columns (w/SS Pipe)	10 days	Mon 7/8/24	Fri 7/19/24	15																																																														
17	Backfill/Slab on Grade	10 days	Mon 7/22/24	Fri 8/2/24	16																																																														
18	Form/Pour Canopy	10 days	Mon 8/5/24	Fri 8/16/24	17																																																														
19	Gyp Wall Framing	20 days	Mon 8/19/24	Fri 9/13/24	18																																																														
20	MEP Rough-ins	40 days	Mon 9/16/24	Fri 11/8/24	19																																																														
21	Gyp Wall Board	20 days	Mon 11/11/24	Fri 12/6/24	20																																																														
22	Patch/Seal Exposed Concrete Finishes	20 days	Mon 12/9/24	Fri 1/3/25	21																																																														
23	Ceiling Framing	20 days	Mon 1/6/25	Fri 1/31/25	22																																																														
24	Glass Partition at Teen Area	10 days	Mon 2/3/25	Fri 2/14/25	23																																																														
25	Doors and Hardware	10 days	Mon 2/17/25	Fri 2/28/25	24																																																														
26	Gyp Bd Ceilings/Surface Mounted Panels/Baffle Ceilings	20 days	Mon 3/3/25	Fri 3/28/25	25																																																														
27	Architectural Wall/Ceiling Finishes	20 days	Mon 3/31/25	Fri 4/25/25	26																																																														
28	MEP Fixtures/Finishes	30 days	Mon 4/28/25	Fri 6/6/25	27																																																														
29	Signs	5 days	Mon 6/9/25	Fri 6/13/25	28																																																														
Project: Hamilton Fish Park Pre Date: Mon 3/6/23		Task	<div></div>	Project Summary	<div></div>	Manual Task	<div></div>	Start-only	<div></div>	Deadline	<div></div>																																																								
		Split	<div></div>	Inactive Task	<div></div>	Duration-only	<div></div>	Finish-only	<div></div>	Progress	<div></div>																																																								
		Milestone	<div></div>	Inactive Milestone	<div></div>	Manual Summary Rollup	<div></div>	External Tasks	<div></div>	Manual Progress	<div></div>																																																								
		Summary	<div></div>	Inactive Summary	<div></div>	Manual Summary	<div></div>	External Milestone	<div></div>																																																										
Page 1																																																																			

ID	Task Name	Duration	Start	Finish	Predecessors	Jul 23, '23 T S W Sep 17, '23 S T M F T S Nov 12, '23 M F T S Jan 7, '24 T S Mar 3, '24 W S Apr 28, '24 T M F T S Jun 23, '24 T S Aug 18, '24 W S Oct 13, '24 T M F T S Dec 8, '24 F T S W S Feb 2, '25 S T M F T S Mar 30, '25 T M F T S May 25, '25 F T S W S Jul 20, '25 S T M F T S Sep 14, '25 S T M F T S																											
30	Window Shades	5 days	Mon 6/16/25	Fri 6/20/25	29																												
31	Floor Finishes	20 days	Mon 6/23/25	Fri 7/18/25	30																												
32	Toilet Accessories/Bollards	5 days	Mon 7/21/25	Fri 7/25/25	31																												
33	Millwork	20 days	Mon 7/28/25	Fri 8/22/25	32																												
34	Exterior Construction	315 days	Mon 4/1/24	Fri 6/13/25																													
35	Temporary Construciton Fence/Tree Protection	5 days	Mon 4/1/24	Fri 4/5/24	11																												
36	Shed & Scaffold	20 days	Mon 4/8/24	Fri 5/3/24	35																												
37	Asbestos Abatement	10 days	Mon 5/6/24	Fri 5/17/24	36																												
38	Sitework removals (landscaping, curbs, planter, pavements)	10 days	Mon 5/20/24	Fri 5/31/24	37																												
39	MEP Disconnects & Removals	5 days	Mon 6/3/24	Fri 6/7/24	38																												
40	Demolish concrete canopy	5 days	Mon 6/10/24	Fri 6/14/24	39,13																												
41	Demolish Roofing	5 days	Mon 6/17/24	Fri 6/21/24	40																												
42	Roofing/Flashing/Fascia Installation	10 days	Mon 6/24/24	Fri 7/5/24	41																												
43	Excavation	5 days	Mon 7/8/24	Fri 7/12/24	42																												
44	Waterproofing	5 days	Mon 7/15/24	Fri 7/19/24	43																												
45	Site drainage piping	5 days	Mon 7/22/24	Fri 7/26/24	44																												
46	Concrete Footings	10 days	Mon 7/29/24	Fri 8/9/24	45																												
47	Backfill to grade	5 days	Mon 8/12/24	Fri 8/16/24	46																												
48	Demolish windows, blocks, louvers, misc masonry	10 days	Mon 8/19/24	Fri 8/30/24	47																												
49	Storefronts/Curtainwall/Entrance Doors/Louvers	20 days	Mon 9/2/24	Fri 9/27/24	48,7																												
50	Masonry Repairs/Staining	15 days	Mon 9/30/24	Fri 10/18/24	49																												
51	Steel Planter Wall/Bench	20 days	Mon 3/31/25	Fri 4/25/25	50																												
52	Irrigation	5 days	Mon 4/28/25	Fri 5/2/25	51																												
53	Backfill/Topsoil/Landscaping	10 days	Mon 5/5/25	Fri 5/16/25	52																												
54	Concrete Pavement/Unit Pavers	10 days	Mon 5/19/25	Fri 5/30/25	53																												
55	Exterior Sign/Flagpole/Bollard	10 days	Mon 6/2/25	Fri 6/13/25	54																												
56	Closeout	20 days	Fri 8/22/25	Fri 9/19/25																													
57	Substantial Completion	0 days	Fri 8/22/25	Fri 8/22/25	55,33																												
58	Punchlist/Demobilization	20 days	Mon 8/25/25	Fri 9/19/25	57																												
59	Final Completion	0 days	Fri 9/19/25	Fri 9/19/25	58																												

Project: Hamilton Fish Park Pre Date: Mon 3/6/23

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

Page 2



March 6, 2023

Anika Barrington
New York City Department of Design and Construction
30-30 Thomson Avenue
Long Island City, NY 11101

**Re: FMS ID # LNCA13HAM – Hamilton Fish Park Library Renovation
Financial Means**

Dear Anika Barrington:

Lanmark's expected means of financing the project will be through the use of its own funds in its bank account. If the need arises, Lanmark has access to a \$3 Million line of credit with TD Bank. Through all its years in business, Lanmark has never had to draw against their line of credit.

If you have any questions, please feel free to contact the undersigned.

Thank You,

A handwritten signature in blue ink, appearing to read "G. Manouselakis", is written over the printed name and title.

George Manouselakis
Corporate Secretary

BUILDING POSSIBILITIES

2125 Mill Avenue | Brooklyn, NY 11234 | [Tel 347.462.4000](tel:347.462.4000) | [Fax 347.462.4001](tel:347.462.4001) | [Web lanmarkgc.com](http://lanmarkgc.com)



March 6, 2023

Anika Barrington
New York City Department of Design and Construction
30-30 Thomson Avenue
Long Island City, NY 11101

**Re: FMS ID # LNCA13HAM – Hamilton Fish Park Library Renovation
Other Issues**

Dear Anika Barrington:

Lanmark does not foresee any issues impacting our ability to complete the project according to the contract.

If you have any questions, please feel free to contact the undersigned.

Thank You,

A handwritten signature in blue ink, appearing to read "G. Manouselakis", is written over the printed name.

George Manouselakis
Corporate Secretary

BUILDING POSSIBILITIES

2125 Mill Avenue | Brooklyn, NY 11234 | [Tel 347.462.4000](tel:347.462.4000) | [Fax 347.462.4001](tel:347.462.4001) | [Web lanmarkgc.com](http://lanmarkgc.com)

CONSTRUCTION EMPLOYMENT REPORT

- | | | |
|-----|--|--------------------|
| 7. | 20-4557644 | info@lanmarkgc.com |
| | Employer Identification Number or Federal Tax I.D. | Email Address |
| 8. | Lanmark Group, Inc. | |
| | Company Name | |
| 9. | 2125 Mill Avenue, Brooklyn, NY 11234 | |
| | Company Address and Zip Code | |
| 10. | Eleftherios Kougentakis | 347-462-4000 |
| | Chief Operating Officer | Telephone Number |
| 11. | George Manouselakis | 347-462-4000 |
| | Designated Equal Opportunity Compliance Officer
(If same as Item #10, write "same") | Telephone Number |
| 12. | same | |
| | Name of Prime Contractor and Contact Person
(If same as Item #8, write "same") | |

13. Number of employees in your company: 16

14. Contract information:

(a) NYC DDC (b) \$14,758,970
Contracting Agency (City Agency) Contract Amount

(c) 85023B0027 (d) _____
Procurement Identification Number (PIN) Contract Registration Number (CT#)

(e) TBD (f) TBD
Projected Commencement Date Projected Completion Date

(g) Description and location of proposed contract:

Hamilton Fish Park Library Renovation, 415 East Houston Street, New York, NY 10002

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 X No _____

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: _____

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

PLEASE SEE ATTACHED CERTIFICATE OF APPROVAL

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.

- _____ (a) Health benefit coverage/description(s) for all management, nonunion and union employees (whether company or union administered)
- _____ (b) Disability, life, other insurance coverage/description
- _____ (c) Employee Policy/Handbook
- _____ (d) Personnel Policy/Manual
- _____ (e) Supervisor's Policy/Manual
- _____ (f) Pension plan or 401k coverage/description for all management, nonunion and union employees, whether company or union administered
- _____ (g) Collective bargaining agreement(s).
- _____ (h) Employment Application(s)
- _____ (i) Employee evaluation policy/form(s).
- _____ (j) Does your firm have medical and/or non-medical (i.e. education, military, personal, pregnancy, child care) leave policy?
- _____ (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___ |
| (b) After a conditional job offer | Yes___ No___ |
| (c) After a job offer | Yes___ No___ |
| (d) Within the first three days on the job | Yes___ No___ |
| (e) To some applicants | Yes___ No___ |
| (f) To all applicants | Yes___ No___ |
| (g) To some employees | Yes___ No___ |
| (h) To all employees | Yes___ No___ |

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

23. Does your firm or any of its collective bargaining agreements require job applicants to take a medical examination? Yes___ No___

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___ 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)

___ Minorities and Women

___ Individuals with handicaps

___ Other. Please specify _____

26. Does your firm or collective bargaining agreement(s) have an internal grievance procedure with respect to EEO complaints? Yes___ No___

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___

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___

If yes, attach a log. See instructions.

29. Are there any jobs for which there are physical qualifications? Yes___ No___

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___

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) George Manouselakis 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.

Lanmark Group, Inc.
Contractor's Name

George Manouselakis Secretary
Name of person who prepared this Employment Report Title

George Manouselakis Secretary
Name of official authorized to sign on behalf of the contractor Title

(347) 462-4000
Telephone Number

[Signature] Date 3/1/23
Signature of authorized official

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.

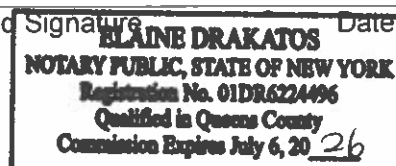
Willful or fraudulent falsifications of any data or information submitted herewith may result in the termination of the contract between the City and the bidder or contractor and in disapproval of future contracts for a period of up to five years. Further, such falsification may result in civil and/or 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 1st day of march 2023

[Signature] Notary Public Authorized Signature Date



FORM A. CONTRACT BID INFORMATION: USE OF SUBCONTRACTORS/TRADES

1. Do you plan to subcontractor work on this contract? Yes X No___
2. If yes, complete the chart below.

NOTE: All proposed subcontractors with a subcontract in excess of \$750,000 must complete an Employment Report for review and approval before the contract may be awarded and work commences.

SUBCONTRACTOR'S NAME*	OWNERSHIP (ENTER APPROPRIATE CODE LETTERS BELOW)	WORK TO BE PERFORMED BY SUBCONTRACTOR	TRADE PROJECTED FOR USE BY SUBCONTRACTOR	PROJECTED DOLLAR VALUE OF SUBCONTRACT
Hepco Heating & Plumbing	B	Plumbing	Plumbers	\$502,500
Trax Mechanical	B	HVAC	Laborers	\$726,500
Raikos Electric	N/A	Electrical	Electricians	\$589,227

***If subcontractor is presently unknown, please enter the trade (craft name).**

OWNERSHIP CODES

W: White
B: Black
H: Hispanic
A: Asian
N: Native American
F: Female

FORM B: PROJECTED WORKFORCE

TRADE CLASSIFICATION CODES

- (J) Journeylevel Workers
- (H) Helper
- (TOT) Total by Column
- (A) Apprentice
- (TRN) Trainee

For each trade to be engaged by your company for this project, enter the projected workforce for Males and Females by trade classification on the charts below.

Trade:
J

Union Affiliation, if applicable

Total (Col. #1-10):
3

Total Minority, Male & Female
(Col. #2,3,4,5,7,8,9, & 10):
2

Total Female
(Col. #6 – 10):
0

		MALES					FEMALES				
		(1) White Non Hisp.	(2) Black Non Hisp.	(3) Hisp.	(4) Asian	(5) Native Amer.	(6) White Non Hisp.	(7) Black Non Hisp.	(8) Hisp.	(9) Asian	(10) Native Amer.
1	J	1	1	1							
	H										
	A										
	TRN										
	TOT	1	1 T	1							

What are the recruitment sources for you projected hires (i.e., unions, government employment office, job tap center, community outreach)?

MWBE organizations, state and local agencies

FORM B: PROJECTED WORKFORCE

Trade:

Union Affiliation, if applicable

Total (Col. #1-10):

Total Minority, Male & Female
(Col. #2,3,4,5,7,8,9, & 10):

Total Female
(Col. #6 – 10):

MALES					FEMALES					
	(1) White Non Hisp.	(2) Black Non Hisp.	(3) Hisp.	(4) Asian	(5) Native Amer.	(6) White Non Hisp.	(7) Black Non Hisp.	(8) Hisp.	(9) Asian	(10) Native Amer.
J										
H										
A										
TRN										
TOT		T								

What are the recruitment sources for you projected hires (i.e., unions, government employment office, job tap center, community outreach)?

FORM C: CURRENT WORKFORCE

TRADE CLASSIFICATION CODES

- (J) Journeylevel Workers
- (H) Helper
- (TOT) Total by Column
- (A) Apprentice
- (TRN) Trainee

For each trade currently engaged by your company for all work performed in New York City, enter the current workforce for Males and Females by trade classification on the charts below.

Trade:
mason tender

Union Affiliation, if applicable
Local 79

Total (Col. #1-10):
1

Total Minority, Male & Female
(Col. #2,3,4,5,7,8,9, & 10):
1

Total Female
(Col. #6 – 10):
0

MALES					FEMALES					
	(1) White Non Hisp.	(2) Black Non Hisp.	(3) Hisp.	(4) Asian	(5) Native Amer.	(6) White Non Hisp.	(7) Black Non Hisp.	(8) Hisp.	(9) Asian	(10) Native Amer.
J		1								
H										
A										
TRN										
TOT		1 T								

What are the recruitment sources for you projected hires (i.e., unions, government employment office, job tap center, community outreach)?

MWBE organizations, state and local agencies

FORM C: CURRENT WORKFORCE

Trade:

Union Affiliation, if applicable

Total (Col. #1-10):

Total Minority, Male & Female
(Col. #2,3,4,5,7,8,9, & 10):

Total Female
(Col. #6 – 10):

MALES					FEMALES					
	(1) White Non Hisp.	(2) Black Non Hisp.	(3) Hisp.	(4) Asian	(5) Native Amer.	(6) White Non Hisp.	(7) Black Non Hisp.	(8) Hisp.	(9) Asian	(10) Native Amer.
J										
H										
A										
TRN										
TOT		T								

What are the recruitment sources for you projected hires (i.e., unions, government employment office, job tap center, community outreach)?



careers
businesses
neighborhoods

Kevin D. Kim
Commissioner

1 Liberty Plaza
11th Floor
New York, NY 10006

212.513.6500 tel
212.618.8891 fax
711 NY Relay

DLS File No. 222CY090

April 11, 2022

Mr. George Manouselakis
Lanmark Group, Inc.
2125 Mill Avenue
Brooklyn, NY 11234

RE: **Department of Design and Construction; PIN# 85022B0044; Poppenhusen Institute Window and Façade Restoration; Contract Value: \$4,482,071.00; Certificate of Approval.**

Dear Mr. Manouselakis:

The Department of Small Business Services/Division of Labor Services has concluded that Lanmark Group, Inc. has met the equal employment opportunity requirements of the City of New York, as stated in Executive Order No. 50 (1980) as amended (E.O. 50), its implementing Rules (Rules), and Chapter 56 of the City Charter (Chapter 56).

Contingent upon Lanmark Group, Inc.'s ongoing compliance with E.O. 50 and Chapter 56, this approval shall be effective for the (3) year period commencing on **April 11, 2022** and terminating on **April 10, 2025**. **The determination for a three-year approval only exempts contractors from completing the policy and procedure section of the employment report on future contracts within the three-year period.** However, a Construction employment report must be submitted for each new project. In addition, Lanmark Group, Inc. must regularly submit to DLS the Monthly Workforce Utilization Table and Payroll Records as explained during the Pre-Award conference on **March 31, 2022**.

PAGE TWO

It is important that Lanmark Group, Inc., as a New York City contractor, provide equal employment opportunity for all employees and applicants for employment.

Please direct all correspondence to Mr. Ra Amen Nu Jah Baddal, Field Auditor. Should you have any questions regarding this letter, you may call Mr. Baddal at (212) 618-6778 or email him at rbaddal@sbs.nyc.gov.

Very truly yours,

Dynishal Gross/DG
Deputy Commissioner/DEFO

c: Chunwee Summors (DDC)
Lorraine Holley (DDC)
Karen General (DDC)
Hemwattie Roopnarine (DDC)
Ra Amen Nu Jah Baddal
File

SCHEDULE B – M/WBE Utilization Plan

Part 1: M/WBE Participation Goals

Contract Overview (To be completed by contracting agency)

APT E-Pin# TBD FMS Project ID# LNCA13HAM
 Project Title LNCA13HAM Agency PIN# TBD
 Contracting Agency Department of Design and Construction Bid/Proposal Response Date TBD
 Agency Address 30-30 Thomson Avenue City Long Island City State NY ZIP 11101
 Contact Person Maria Johnston Title MWBE Outreach & Compliance Analyst
 Telephone _____ Email latorrema@ddc.nyc.gov

Project Description (attach additional pages if necessary)

Upgrade and provide selective renovation of the interior and exterior of the building and seeks to enhance the library's street presence and visibility to the Hamilton Fish Park Branch Renovation – Borough of Manhattan

Bidder or proposer ☐ is required OR ☒ is not required to specifically identify the contact information of all M/WBE firms they intend to use as a subcontractor on this contract, including the M/WBE vendor name, address and telephone number in the space provided below in Part 2 Section 4.

M/WBE Participation Goals for Services

Enter the percentage amount for each category or for an unspecified Goal.

Prime Contract Industry: Construction

Category and Breakdown:

Unspecified	7.00	%
Black American	9.00	%
Hispanic American	10.00	%
Asian American	0.00	%
Women	0.00	%

Total Participation Goals 26.00 %
Line 1

Part 2: M/WBE Participation Plan

(To be completed by the bidder/proposer unless granted a full waiver, which must be submitted with the bid/proposal in lieu of this form)

Section 1: Prime Contractor Contact Information

Tax ID# 20-4557644 FMS Vendor ID# 0002764003
 Business Name Lanmark Group, Inc. Contact Person George Manouselakis
 Business Address 2125 Mill Avenue City Brooklyn State NY ZIP 11234
 Telephone 347-462-4000 Email info@lanmargkgc.com

Section 3: Contractor M/WBE Utilization Plan

Please review the Notice to Prospective Contractors for more information on how to obtain credit for M/WBE participation. Check applicable box. The Proposer or Bidder will fulfill the M/WBE Participation Goals:

- ☐ As an M/WBE Prime Contractor that will self-perform and/or subcontract to other M/WBE firms a portion of the contract the value of which is at least the amount located on Lines 2 or 3 in the panels in Section 2, as applicable. The value of any work subcontracted to non-M/WBE firms will not be credited towards fulfillment of M/WBE Participation Goals. Please check all that apply to Prime Contractor: ☐ MBE ☐ WBE
- ☐ As a Qualified Joint Venture with an M/WBE partner, in which the value of the M/WBE partner's participation and/or the value of any work subcontracted to other M/WBE firms is at least the amount located on Lines 2 or 3 in the panels in Section 2, as applicable. The value of any work subcontracted to non-M/WBE firms will not be credited towards fulfillment of M/WBE Participation Goals.
- ☒ As a non-M/WBE Prime Contractor that will enter into subcontracts with M/WBE firms the value of which is at least the amount located on Lines 2 or 3 in the panels in Section 2, as applicable.

Section 2: M/WBE Utilization Goal Calculation

Prime Contractor Adopting Agency Participation Goals

For Prime Contractors (including Qualified Joint Ventures and M/WBE firms) adopting Agency M/WBE Participation Goals.

Total Bid/Proposal Value \$14,758,970
multiplied by x

Total Participation Goals 26 %
(Line 1 above)

Calculated M/WBE Participation Amount \$ 3,837,332.20
Line 2

OR

Prime Contractor With Partial Waiver Approval Adopting Revised Participation Goals

For Prime Contractors (including Qualified Joint Ventures and M/WBE firms) adopting Revised M/WBE Participation Goals.

Total Bid/Proposal Value \$ _____
multiplied by x

Total Revised Participation Goals _____ %

Calculated M/WBE Participation Amount \$ _____
Line 3

Section 4: General Contract Information

What is the expected percentage of the total contract dollar value that you expect to award in subcontracts for services, regardless of M/WBE status?

60 %

Enter a brief description of the type(s) and dollar value of subcontracts for all services you plan to subcontract if awarded this contract, along with the anticipated start and end dates for such subcontracts. For each item, indicate whether the work is designated for participation by an M/WBE. Where the contracting agency's solicitation has indicated a requirement that the bidder or proposer specifically identify the contact information of all M/WBEs they intend to use on this contract, vendors must also include the M/WBE vendor name, address and telephone number in the space provided below. Use additional sheets if necessary.

Description of Work	Start Date (MM/YY)	End Date (MM/YY)	Planned \$ Amount	Designated for M/WBE		M/WBE Vendor Name	M/WBE Address	M/WBE Telephone
				Y	N			
1. Plumbing	10 / 23	9 / 25	\$ 502,500.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Hepco Heating & Plumbing	Black American 180-08 Liberty Ave., Jamaica, NY 11433	(718) 935 - 0900
2. HVAC	10 / 23	9 / 25	\$ 726,500.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Trax Mechanical	Black American 100 Bogart St., Brooklyn, NY 11206	(929) 294 - 9358
3. Electrical	10 / 23	9 / 25	\$ 589,227.00	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Raikos Electric	495 Canal St., New York, NY 10013	(718) 840 - 9712
4. Shed & Scaffold	10/23	9/25	\$ 100,000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TBD	Hispanic American	() -
5. Site Maintenance	10/ 23	9 /25	\$ 300,000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TBD	Hispanic American	() -
6. Demolition	10/ 23	9 /25	\$ 450,000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TBD	Unspecified	() -
7. Asbestos Abatement	10/ 23	9/25	\$ 240,000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TBD	Black American	() -
8. Masonry	10 23	9/25	\$ 100,000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	TBD		() -
9. Steel	10 23	9/25	\$ 50,000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	TBD		() -
10. Millwork	10 23	9/25	\$ 500,000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TBD	Hispanic American	() -

Section 5: Vendor Certification and Required Affirmations

I hereby:

1. acknowledge my understanding of the M/WBE participation requirements as set forth herein and the pertinent provisions of Section 6-129 of the Administrative Code of the City of New York ("Section 6-129"), and the rules promulgated thereunder;
2. affirm that the information supplied in support of this 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
5. 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.

Signature



Date

3/1/23

Print Name George Manouselakis

Title Secretary

Section 4: General Contract Information

What is the expected percentage of the total contract dollar value that you expect to award in subcontracts for services, regardless of M/WBE status?

60.00 %

Enter a brief description of the type(s) and dollar value of subcontracts for all services you plan to subcontract if awarded this contract, along with the anticipated start and end dates for such subcontracts. For each item, indicate whether the work is designated for participation by an M/WBE. Where the contracting agency's solicitation has indicated a requirement that the bidder or proposer specifically identify the contact information of all M/WBEs they intend to use on this contract, vendors must also include the M/WBE vendor name, address and telephone number in the space provided below. Use additional sheets if necessary.

Description of Work	Start Date (MM/YY)	End Date (MM/YY)	Planned \$ Amount	Designated for M/WBE		M/WBE Vendor Name	M/WBE Address	M/WBE Telephone
				Y	N			
1. Roofing	10 / 23	9 / 25	\$ 350,000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TBD	Unspecified	() -
2. Glazing	10 / 23	9 / 25	\$ 520,000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TBD	Hispanic American	() -
3. Signs	10 / 23	9 / 25	\$ 30,000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	TBD		() -
4. Ceramic Tiles	10 / 23	9 / 25	\$ 60,000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TBD	Unspecified	() -
5. Flooring	10 / 23	9 / 25	\$ 200,000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	TBD		() -
6. Painting	10 / 23	9 / 25	\$ 75,000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TBD	Hispanic American	() -
7. Shades	10 / 23	9 / 25	\$ 40,000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	TBD		() -
8. Pavers	10 / 23	9 / 25	\$ 16,000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TBD	Hispanic American	() -
9. Concrete & Sitework	10/23	9 / 25	\$ 300,000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	TBD		() -
10. Irrigation & Landscaping	10/23	9/25	\$ 50,000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	TBD		() -

Section 5: Vendor Certification and Required Affirmations

I hereby:

1. acknowledge my understanding of the M/WBE participation requirements as set forth herein and the pertinent provisions of Section 6-129 of the Administrative Code of the City of New York ("Section 6-129"), and the rules promulgated thereunder;
2. affirm that the information supplied in support of this 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
5. 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.

Signature



Date

3/1/23

Print Name, George Manouselakis

Title, Secretary



**Department of
Design and
Construction**

PROJECT ID:

LNCA13HAM

**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/buildnyc

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

Hamilton Fish Park Library Renovation

**LOCATION:
BOROUGH:
CITY OF NEW YORK**

**415 East Houston Street
New York, NY 10002**

CONTRACT NO. 1

GENERAL CONSTRUCTION WORK

New York Public Library

Rice + Lipka Architects

Date: November 3, 2022





**Department of
Design and
Construction**

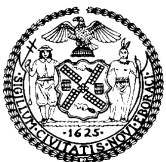
**THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF PUBLIC BUILDINGS**

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

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



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 trustee 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 Castignoli
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: popparocheg@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: jasonl@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 Street
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 926
373 96th Street
Brooklyn, NY 11209
P: 718-491-0926

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

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

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

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

Metal Lathers Local 46

1332 Third Avenue

New York, NY 10021

Business Manager:

P: 212-737-0500

email:

Ironworkers Local 40

451 Park Avenue South

New York, NY 10016

Business Manager: Bob Walsh

P: 212-889-1320

email: bobwalsh@ironworkers.net

Derrickmen & Riggers Local 197

35-53 24th Street

LIC, NY 11106

Business Manager: William Hayes

P: 718-361-6534

email: billhayes197@yahoo.com

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

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:

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

**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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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	

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

**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;

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

- (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”),

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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;

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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.

2020 NYC AGENCY RENOVATION PROJECT LABOR 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,

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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,

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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.

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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.

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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,

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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 trustee 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 trustee 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.

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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)(1) 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 trustee 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.

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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.

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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 or 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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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.

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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".

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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,

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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,

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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.

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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
Gary LaBarbera
President

FOR NEW YORK CITY

BY: Dean Fuleihan
Dean Fuleihan
First Deputy Mayor

APPROVED AS TO FORM:

Steve Stein Cusumano
ACTING CORPORATION COUNSEL
NEW YORK CITY

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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): _____

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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.

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

Page 5 of 5

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;

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

sponsor of a program bypassing the general recruitment scheduled for the Apprentices 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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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.

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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.

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

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.

	Screening	Confirmation
	Cut-Off	Cut-off
<u>Drug Class</u>	<u>Limit (ng/ml)</u>	<u>Limit (ng/ml)</u>
Amphetamines	1000	500
Benzoylcegonine (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.

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

- 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 it 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, contractor'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 oversight 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 Non-Compensable Delays and Grounds for Extension;
- Rider regarding NYC Earned Safe and Sick Time Act.

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.

**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 Policies 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.

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; NOTICES AND 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 A TIME & 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 OR ARCHITECT	

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 actually inserted 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 and Proposal 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 by the 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 and design 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**, or his/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 right to 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 with the **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; NOTICES AND 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 Additional Insureds, 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 any appropriate 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 or contributing 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 Method in 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 various operations 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, in the 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 delay in the performance of this **Contract** 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 neither known 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, has not 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 extends the 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 of delay 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 multiple of 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 and no 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 of the 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 Insured and 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 to do 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 applicable to 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** to the 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., as referred 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** by authorizing 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 expiration of 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 in the 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 to a 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 for that 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: $(.035) \times (\text{HP rating}) \times (\text{Fuel cost/gallon})$. 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: $(.035) \times (\text{HP rating}) \times (\text{Fuel cost/gallon})$. 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** in the 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 A TIME & 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 with respect 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 resolution procedure.

CHAPTER VII: POWERS OF THE RESIDENT ENGINEER, THE ENGINEER OR ARCHITECT 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 by the **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 issue an **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 **Contract** 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 out of 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 with the

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 time². 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 provider has 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 PSLI 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 PSLI 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 PSLI 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 PSLI. In addition, an employer may not interfere with any investigation, proceeding, or hearing pursuant to the PSLI.

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 PSLI. 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 Policies 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 terms of the **Contract** and this Article 35.6 (1) 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 parts of 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 a monthly 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 qualified and 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 repair of 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 applicant for 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, rates of 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 Administrative Code, 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 as a 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 Notice of 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 which the **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 or she 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 a condition 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 used if 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 performance of 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 price or 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 submit to 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 44 and 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 intended for 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; or if

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** shall be 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 of reducing 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 forth in 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 perform the **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 asserted within 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 the facts 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 employee of 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 address specified 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 for the 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 New York 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 interest in, 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 in assessing 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 to the 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 the person 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 that has 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 **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 to the 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 in a

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 will be 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 of the 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 if the **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 of the 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** ineligible to 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 construction 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 to and 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 assess, 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 action efforts 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 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 strict accordance 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 reasonably have 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 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. 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.

2020 NYC AGENCY RENOVATION PROJECT LABOR AGREEMENT

Exhibit A

Project Labor Agreement - Letter of Assent

Dear: 3/1/23

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 Hamilton Fish Park Library, (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: Hamilton Fish Park Library Renovation

Contract Number(s): LNCA13HAM

3/1/23

(Signature)

Contractor's State License #

State of NY
County of Kings
Sworn to before me this
1st day of March 2023
Elvin Perri
Notary Public



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 **LANMARK GROUP, INC.** ("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 **85023B0027-LNCA13HAM**.

1. **(Bid) - Bidders Identification of Subcontractors.pdf - Aug 2 2023 3:59PM**
2. **(Question answer) - 2020_OSHA_300.pdf - Aug 2 2023 3:59PM**
3. **(Question answer) - 2021_OSHA_300.pdf - Aug 2 2023 3:59PM**
4. **(Question answer) - 2022_OSHA_300.pdf - Aug 2 2023 3:59PM**
5. **(Question answer) - Bid Bond (Hamilton Fish Park Library).pdf - Aug 2 2023 3:59PM**
6. **Bid breakdown - Aug 7 2023 4:40PM**
7. **Broker's Certification - Aug 10 2023 1:39PM**
8. **Disability Insurance - Aug 10 2023 1:40PM**
9. **DLS Approval - Aug 7 2023 5:45PM**
10. **Insurance Certification (GL, Auto, Umb) - Aug 10 2023 1:41PM**
11. **LNCA13HAM_Addendum1 - Aug 2 2023 3:59PM**
12. **LNCA13HAM_Addendum2 - Aug 2 2023 3:59PM**
13. **LNCA13HAM_Addendum3 - Aug 2 2023 3:59PM**
14. **LNCA13HAM_Bid Drawings_Addendum2 - Aug 2 2023 3:59PM**
15. **LNCA13HAM_DDC Proprietary List - Aug 2 2023 3:59PM**
16. **LNCA13HAM_Volume2 - Aug 2 2023 3:59PM**
17. **LNCA13HAM_Volume3_Addendum3 - Aug 2 2023 3:59PM**
18. **Payment Bond - Aug 10 2023 1:42PM**
19. **Performance Bond - Aug 10 2023 1:42PM**
20. **PLA - Aug 7 2023 5:17PM**
21. **Proposal/Bid - Aug 2 2023 3:59PM**
22. **Round Addendum Job Aid - Aug 2 2023 3:59PM**
23. **Schedule B - Aug 7 2023 5:05PM**
24. **Volume 1 (PLA) - Aug 2 2023 3:59PM**
25. **Worker's Compensation Insurance - Aug 10 2023 1:40PM**

The above order does not represent an order of precedence. The Contract shall be governed by the 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:

Thomas Foley

FE0ABB939FF24B0...
(Signature)

Name: Thomas Foley

Title: Commissioner

Date: 8/14/2023 | 12:39:13 EDT

Contractor

By: LANMARK GROUP, INC.

Designed by:



172CF27F12244A8...
(Signature)

Name: George Manouselakis

Title: Corporate Secretary

Date: 8/14/2023 | 09:37:55 PDT

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.

Alliant Insurances Services, Inc.

[Name of broker or agent (typewritten)]

333 Earle Ovington Blvd. Uniondale, NY 11553

[Address of broker or agent (typewritten)]

angela.devincenzi@alliant.com

[Email address of broker or agent (typewritten)]

516-414-7298

[Phone number/Fax number of broker or agent (typewritten)]



[Signature of authorized official, broker, or agent]

Angela DeVincenzi, Assistant Account Manager

[Name and title of authorized official, broker, or agent (typewritten)]

State of New York.....)

) ss.:

County of Nassau.....)

Sworn to before me this 1st day of August 2023



NOTARY PUBLIC FOR THE STATE OF New York

ELIZABETH LYNNE HAGGERTY
Notary Public, State of New York
NO. 01HA8301896
Qualified in Suffolk County
Commission Expires April 28, 2026



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

8/1/2023

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 Alliant Insurance Services, Inc. 333 Earle Ovington Blvd, Ste 700 Uniondale NY 11553	CONTACT NAME: Stefanie Blair PHONE (A/C, No, Ext): 516-414-8900 E-MAIL ADDRESS: sblair@alliant.com FAX (A/C, No):
INSURED Lanmark Group, Inc. 2125 Mill Avenue Brooklyn, NY 11234	INSURER(S) AFFORDING COVERAGE INSURER A: Phoenix Insurance Company INSURER B: Travelers Indemnity Company INSURER C: Navigators Insurance Company INSURER D: Travelers Indemnity Company of INSURER E: Charter Oak Fire Insurance Com INSURER F:

COVERAGES**CERTIFICATE NUMBER:** 415884750**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
D	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:			DT1N-CO-8J552946-TCT-22	10/31/2022	10/31/2023	EACH OCCURRENCE \$2,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$300,000 MED EXP (Any one person) \$10,000 PERSONAL & ADV INJURY \$2,000,000 GENERAL AGGREGATE \$4,000,000 PRODUCTS - COMP/OP AGG \$4,000,000 \$
E	<input checked="" type="checkbox"/> AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS ONLY <input checked="" type="checkbox"/> NON-OWNED AUTOS ONLY			BA-6N500683-22-26-G	10/31/2022	10/31/2023	COMBINED SINGLE LIMIT (Ea accident) \$1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
B	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED <input checked="" type="checkbox"/> RETENTION \$ 10,000			CUP-9H968597-22-26	10/31/2022	10/31/2023	EACH OCCURRENCE \$5,000,000 AGGREGATE \$5,000,000 \$
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N <input checked="" type="checkbox"/> N	N/A	UB-8J560080-22-26-G	10/31/2022	10/31/2023	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$1,000,000 E.L. DISEASE - EA EMPLOYEE \$1,000,000 E.L. DISEASE - POLICY LIMIT \$1,000,000
C	Contractor's Pollution Liability			NY22ECPZ037ZVIV	10/31/2022	10/31/2023	Each Occurrence \$3,000,000 Aggregate \$3,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

NYC Department of Design and Construction, The City of New York, including its employees and officials, Astor, Lenox and Tilden Foundations, the New York Public Library and its trustees, officers, agents and employees are included as Additional Insured as respects Liability arising out of work performed by the Named Insured. The insurance provided shall be primary and any other insurance maintained by the Additional Insured is excess and non-contributory. Waiver of Subrogation applies as required by contract.

CERTIFICATE HOLDER**CANCELLATION**

NYC Department of Design and Construction
30-30 Thomson Avenue
Long Island City NY 11101

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.



CERTIFICATE OF NYS WORKERS' COMPENSATION INSURANCE COVERAGE

1a. Legal Name & Address of Insured (use street address only) Lanmark Group, Inc. 2125 Mill Avenue Brooklyn, NY 11234 <i>Work Location of Insured (Only required if coverage is specifically limited to certain locations in New York State, i.e., a Wrap-Up Policy)</i>	1b. Business Telephone Number of Insured (347) 462-4000 1c. NYS Unemployment Insurance Employer Registration Number of Insured 1d. Federal Employer Identification Number of Insured or Social Security Number 204557644
2. Name and Address of Entity Requesting Proof of Coverage (Entity Being Listed as the Certificate Holder) NYC Department of Design and Construction 30-30 Thomson Ave Long Island City, NY 11101	3a. Name of Insurance Carrier The Phoenix Insurance Company 3b. Policy Number of Entity Listed in Box "1a" UB-8J560080-22-26-G 3c. Policy effective period 10/31/22 to 10/31/23 3d. The Proprietor, Partners or Executive Officers are <input checked="" type="checkbox"/> included. (Only check box if all partners/officers included) <input type="checkbox"/> all excluded or certain partners/officers excluded.

This certifies that the insurance carrier indicated above in box "3" insures the business referenced above in box "1a" for workers' compensation under the New York State Workers' Compensation Law. **(To use this form, New York (NY) must be listed under Item 3A on the INFORMATION PAGE of the workers' compensation insurance policy).** The Insurance Carrier or its licensed agent will send this Certificate of Insurance to the entity listed above as the certificate holder in box "2".

The insurance carrier must notify the above certificate holder and the Workers' Compensation Board within 10 days IF a policy is canceled due to nonpayment of premiums or within 30 days IF there are reasons other than nonpayment of premiums that cancel the policy or eliminate the insured from the coverage indicated on this Certificate. (These notices may be sent by regular mail.) **Otherwise, this Certificate is valid for one year after this form is approved by the insurance carrier or its licensed agent, or until the policy expiration date listed in box "3c", whichever is earlier.**


This certificate is issued as a matter of information only and confers no rights upon the certificate holder. This certificate does not amend, extend or alter the coverage afforded by the policy listed, nor does it confer any rights or responsibilities beyond those contained in the referenced policy.

This certificate may be used as evidence of a Workers' Compensation contract of insurance only while the underlying policy is in effect.

Please Note: Upon cancellation of the workers' compensation policy indicated on this form, if the business continues to be named on a permit, license or contract issued by a certificate holder, the business must provide that certificate holder with a new Certificate of Workers' Compensation Coverage or other authorized proof that the business is complying with the mandatory coverage requirements of the New York State Workers' Compensation Law.

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 the coverage as depicted on this form.

Approved by: Stefanie Blair
(Print name of authorized representative or licensed agent of insurance carrier)

Approved by: 
(Signature) 8/1/2023
(Date)

Title: Account Manager - Lead

Telephone Number of authorized representative or licensed agent of insurance carrier: 516-414-8656

Please Note: Only insurance carriers and their licensed agents are authorized to issue Form C-105.2. Insurance brokers are NOT authorized to issue it.

Workers' Compensation Law

Section 57. Restriction on issue of permits and the entering into contracts unless compensation is secured.

1. The head of a state or municipal department, board, commission or office authorized or required by law to issue any permit for or in connection with any work involving the employment of employees in a hazardous employment defined by this chapter, and notwithstanding any general or special statute requiring or authorizing the issue of such permits, shall not issue such permit unless proof duly subscribed by an insurance carrier is produced in a form satisfactory to the chair, that compensation for all employees has been secured as provided by this chapter. Nothing herein, however, shall be construed as creating any liability on the part of such state or municipal department, board, commission or office to pay any compensation to any such employee if so employed.
2. The head of a state or municipal department, board, commission or office authorized or required by law to enter into any contract for or in connection with any work involving the employment of employees in a hazardous employment defined by this chapter, notwithstanding any general or special statute requiring or authorizing any such contract, shall not enter into any such contract unless proof duly subscribed by an insurance carrier is produced in a form satisfactory to the chair, that compensation for all employees has been secured as provided by this chapter.



Workers'
Compensation
Board

CERTIFICATE OF INSURANCE COVERAGE

NYS DISABILITY AND PAID FAMILY LEAVE BENEFITS LAW

PART 1. To be completed by NYS disability and Paid Family Leave benefits carrier or licensed insurance agent of that carrier

1a. Legal Name & Address of Insured (use street address only) Lanmark Group Inc. 2125 Mill Avenue Brooklyn, NY 11234 <small>Work Location of Insured (Only required if coverage is specifically limited to certain locations in New York State, i.e., Wrap-Up Policy)</small>	1b. Business Telephone Number of Insured 347-462-4000 1c. Federal Employer Identification Number of Insured or Social Security Number 204557644
2. Name and Address of Entity Requesting Proof of Coverage (Entity Being Listed as the Certificate Holder) NYC Department of Design and Construction 30-30 Thomson Ave Long Island City, NY 11101	3a. Name of Insurance Carrier Arch Insurance Company 3b. Policy Number of Entity Listed in Box 1a 11DBL8368000 3c. Policy Effective Period 1/1/2023 to 12/31/2023

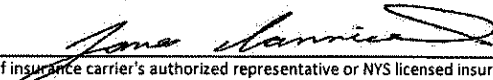
4. Policy provides the following benefits:

- ☒ A. Both disability and Paid Family Leave benefits.
☐ B. Disability benefits only.
☐ C. Paid Family Leave benefits only.

5. Policy covers:

- ☒ 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 1/19/2023 By 
(Signature of insurance carrier's authorized representative or NYS licensed insurance agent of that insurance carrier)
Telephone Number 201-743-3937 Name and Title James Iannicelli, AVP Accident & Health

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 emailed to PAU@wcb.ny.gov or it can be mailed for completion to the Workers' Compensation Board, Plans Acceptance Unit, PO Box 5200, Binghamton, NY 13902-5200.

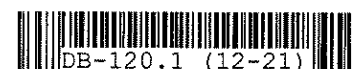
PART 2. To be completed by the NYS Workers' Compensation Board (Only if Box 4B, 4C or 5B have been checked)

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 (Article 9 of the Workers' Compensation Law) with respect to all of their 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.**



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.

Alliant Insurance Services, Inc

[Name of broker or agent (typewritten)]

333 Earle Ovington Blvd. Uniondale, NY 11553

[Address of broker or agent (typewritten)]

sblair@alliant.com

[Email address of broker or agent (typewritten)]

516-414-8656/877-308-1070

[Phone number/Fax number of broker or agent (typewritten)]



[Signature of authorized official, broker, or agent]

Stefanie Blair, Account Manager - Lead

[Name and title of authorized official, broker, or agent (typewritten)]

State of New York.....)

) ss.:

County of Nassau.....)

Sworn to before me this 19 day of January 20 23



NOTARY PUBLIC FOR THE STATE OF New York

ELIZABETH LYNN HAGGERTY
Notary Public, State of New York
NO. 01148301808
Qualified in Suffolk County
Commission Expires April 28, 2026

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 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

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, 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 null and void, otherwise to remain in full force and effect.

The Surety (Sureties), for value received, hereby stipulates and agrees, upon written notice from the City that the City has determined that the Principal is in default of the Contract, to (1) pay the City the cost to complete 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 the cost of completion plus any applicable damages and costs under option (1) above, 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 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 time as 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 cost of 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 by any extension of time, modification, omission, addition, or change in or to 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 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 done and 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 for the completion of the Contract as if such sums had not been paid to the Principal, but shall not provide a basis 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.

PERFORMANCE BOND #1 (Page 3)

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 duly authorized officer, agent, or attorney-in-fact.

There should be executed an appropriate number of counterparts of the bond corresponding to the number of 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 resides at _____; 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 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.

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 #2 KNOW ALL PERSONS BY THESE PRESENTS:,

That we, Lanmark Group, Inc.

2125 Mill Avenue, Brooklyn, NY 11234

hereinafter referred to as the "Principal,"
and, Liberty Mutual Insurance Company

1200 MacArthur Blvd., Mahwah, NJ 07430

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 Fourteen Million Seven Hundred Fifty Eight Thousand Nine Hundred Seventy and 00/100

(\$ 14,758,970.00) 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

LNCA13HAM Hamilton Fish Park 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, 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 null and void, otherwise to remain in full force and effect.

PERFORMANCE BOND #2 (Page 2)

The Surety (Sureties), for value received, hereby stipulates and agrees, upon written notice from the City that 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 the Contract, 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 thereof from 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 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 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 by any extension of time, modification, omission, addition, or change in or to 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 Work to be performed 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, 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 by or in relation to said Principal.

PERFORMANCE BOND #2 (Page 3)

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 _____ August _____ 20 23 _____.

(Seal)

Lanmark Group, Inc. (L.S.)

Principal

(Seal)

By:

Surety

Liberty Mutual Insurance Company

By:

Robert Kempner, Attorney-In-Fact

Surety

(Seal)

By:

Surety

(Seal)

By:

Surety

(Seal)

By:

Surety

(Seal)

By:

Bond Premium Rate \$14.40/m sliding scale

Bond Premium Cost \$99,412.00

If the Contractor (Principal) is a partnership, the bond should be signed by each of the individuals who are partners.

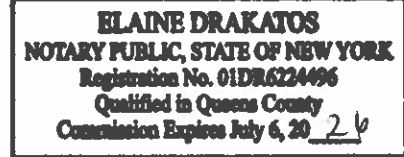
If the Contractor (Principal) is a corporation, the bond should be signed in its correct corporate name by duly authorized officer, agent, or attorney-in-fact.

There should be executed an appropriate number of counterparts of the bond corresponding to the number of counterparts of the Contract.

ACKNOWLEDGMENT OF PRINCIPAL IF A CORPORATION

State of NY County of Kings ss:
 On this 9th day of August, 20 23 before me personally
 came Gregory Kougentakis
 to me known, who, being by me duly sworn did depose and say that he resides at
11 Roslyn Drive, Glen Head, NY 11545; that he/she is the Vice 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.

Elaine Drakatos
 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 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.

ACKNOWLEDGMENT OF SURETY

STATE OF NEW YORK
COUNTY OF NASSAU SS:

On this 1st day of August, 2023 before me personally came Robert Kempner to me known, who, being by me duly sworn, did depose and say that he is the Attorney-In-Fact of Liberty Mutual Insurance Company the corporation described in and which executed the within instrument; that he knows the seal of said corporation; that the seal affixed to the within instrument is such corporate seal; and that he signed the said instrument and affixed the said seal as Attorney-In-Fact by authority of the Board of Directors of said corporation and by authority of this office under the Standing Resolutions thereof.

Danielle Heckman
(NOTARY PUBLIC)

Danielle Heckman
Notary Public, State of New York
No. 01HE6302468
Qualified in Nassau County
Commission Expires 11/28/2026



This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

Certificate No: **8205971-015019**

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Joseph M. Sforzo, Robert Kempner, Robert W. O'Kane

all of the city of Plainview state of NY each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 15th day of July, 2021.



Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

By: David M. Carey
David M. Carey, Assistant Secretary

State of PENNSYLVANIA
County of MONTGOMERY ss

On this 15th day of July, 2021 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



Commonwealth of Pennsylvania - Notary Seal
Teresa Pastella, Notary Public
Montgomery County
My commission expires March 28, 2025
Commission number 1126044
Member, Pennsylvania Association of Notaries

By: Teresa Pastella
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV - OFFICERS: Section 12. Power of Attorney.

Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII - Execution of Contracts: Section 5. Surety Bonds and Undertakings.

Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 1st day of August, 2023.



By: Renee C. Llewellyn
Renee C. Llewellyn, Assistant Secretary



LIBERTY MUTUAL INSURANCE COMPANY

Financial Statement – December 31, 2022

Assets		Liabilities	
Cash and Bank Deposits	\$3,908,755,039	Unearned Premiums.....	\$10,133,358,204
*Bonds — U.S Government.....	3,451,999,931	Reserve for Claims and Claims Expense.....	27,953,643,316
*Other Bonds	18,862,255,155	Funds Held Under Reinsurance Treaties.....	368,610,620
*Stocks	19,372,953,698	Reserve for Dividends to Policyholders	1,379,296
Real Estate.....	190,092,373	Additional Statutory Reserve	197,278,000
Agents' Balances or Uncollected Premiums	7,929,876,358	Reserve for Commissions, Taxes and	
Accrued Interest and Rents	166,740,412	Other Liabilities.....	9,206,000,954
		Total.....	\$47,860,270,390
Other Admitted Assets	15,968,062,977	Special Surplus Funds	\$195,696,103
Total Admitted Assets	<u>\$69,850,735,943</u>	Capital Stock	10,000,075
		Paid in Surplus	13,324,803,036
		Unassigned Surplus	8,459,966,339
		Surplus to Policyholders	21,990,465,553
		Total Liabilities and Surplus	<u>\$69,850,735,943</u>



* Bonds are stated at amortized or investment value; Stocks at Association Market Values.
The foregoing financial information is taken from Liberty Mutual Insurance Company's financial statement filed with the state of Massachusetts Department of Insurance.

I, TIM MIKOLAJEWSKI, Assistant Secretary of Liberty Mutual Insurance Company, do hereby certify that the foregoing is a true, and correct statement of the Assets and Liabilities of said Corporation, as of December 31, 2022, to the best of my knowledge and belief.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of said Corporation at Seattle, Washington, this 8th day of March 2023.

TAMikolajewski

Assistant Secretary



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, Lanmark Group, Inc.

2125 Mill Avenue, Brooklyn, NY 11234

hereinafter referred to as the "Principal", and Liberty Mutual Insurance Company

1200 MacArthur Blvd., Mahwah, NJ 07430

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

Fourteen Million Seven Hundred Fifty Eight Thousand Nine Hundred Seventy and 00/100

(\$ 14,758,970.00) 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

LNCA13HAM Hamilton Fish Park 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

PAYMENT BOND (Page 2)

(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 in full 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 right of the City to require a bond containing the foregoing provisions, and they do hereby further expressly waive any 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 placed 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.

PAYMENT BOND (Page 3)

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 August, 2023.

(Seal)

Lanmark Group, Inc. (L.S.) Principal

By:

Gregory Kougontakis, Vice President

(Seal)

Liberty Mutual Insurance Company Surety

By:

Robert Kemper, 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 duly authorized officer, agent, or attorney-in-fact.

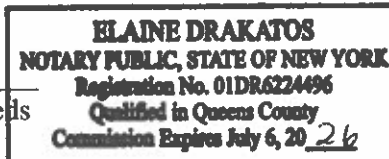
There should be executed an appropriate number of counterparts of the bond corresponding to the number of counterparts of the Contract.

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of NY County of Kings ss:

On this 9th day of August, 2023, before me personally came Gregory Kougentakis to me known, who, being by me duly sworn did depose and say that he resides at 11 Roslyn Drive, Glen Head, NY 11545 that he is the Vice 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.

Elaine Drakatos
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 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.

ACKNOWLEDGMENT OF SURETY

STATE OF NEW YORK
COUNTY OF NASSAU SS:

On this 1st day of August, 2023 before me personally came Robert Kempner to me known, who, being by me duly sworn, did depose and say that he is the Attorney-In-Fact of Liberty Mutual Insurance Company the corporation described in and which executed the within instrument; that he knows the seal of said corporation; that the seal affixed to the within instrument is such corporate seal; and that he signed the said instrument and affixed the said seal as Attorney-In-Fact by authority of the Board of Directors of said corporation and by authority of this office under the Standing Resolutions thereof.


(NOTARY PUBLIC)

Danielle Heckman
Notary Public, State of New York
No. 01HE6302468
Qualified in Nassau County
Commission Expires 11/28/2026



This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

Certificate No: **8205971-015019**

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Joseph M. Sforzo, Robert Kempner, Robert W. O'Kane

all of the city of Plainview state of NY each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 15th day of July, 2021.



Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

By: David M. Carey
David M. Carey, Assistant Secretary

State of PENNSYLVANIA ss
County of MONTGOMERY

On this 15th day of July, 2021 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



Commonwealth of Pennsylvania - Notary Seal
Teresa Pastella, Notary Public
Montgomery County
My commission expires March 28, 2025
Commission number 1126044
Member, Pennsylvania Association of Notaries

By: Teresa Pastella
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV - OFFICERS: Section 12. Power of Attorney.

Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII - Execution of Contracts: Section 5. Surety Bonds and Undertakings.

Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 1st day of August, 2023.



By: Renee C. Llewellyn
Renee C. Llewellyn, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

For bond and/or Power of Attorney (POA) verification inquiries, please call 610-832-8240 or email HOSUR@libertymutual.com.



LIBERTY MUTUAL INSURANCE COMPANY

Financial Statement – December 31, 2022

Assets		Liabilities	
Cash and Bank Deposits	\$3,908,755,039	Unearned Premiums.....	\$10,133,358,204
*Bonds — U.S Government.....	3,451,999,931	Reserve for Claims and Claims Expense.....	27,953,643,316
*Other Bonds	18,862,255,155	Funds Held Under Reinsurance Treaties.....	368,610,620
*Stocks	19,372,953,698	Reserve for Dividends to Policyholders	1,379,296
Real Estate.....	190,092,373	Additional Statutory Reserve.....	197,278,000
Agents' Balances or Uncollected Premiums.....	7,929,876,358	Reserve for Commissions, Taxes and	
Accrued Interest and Rents.....	166,740,412	Other Liabilities.....	9,206,000,954
Other Admitted Assets.....	15,968,062,977	Total	\$47,860,270,390
Total Admitted Assets	<u>\$69,850,735,943</u>	Special Surplus Funds	\$195,696,103
		Capital Stock	10,000,075
		Paid in Surplus	13,324,803,036
		Unassigned Surplus	8,459,966,339
		Surplus to Policyholders	21,990,465,553
		Total Liabilities and Surplus	<u>\$69,850,735,943</u>



* Bonds are stated at amortized or investment value; Stocks at Association Market Values.
The foregoing financial information is taken from Liberty Mutual Insurance Company's financial statement filed with the state of Massachusetts Department of Insurance.

I, TIM MIKOLAJEWSKI, Assistant Secretary of Liberty Mutual Insurance Company, do hereby certify that the foregoing is a true, and correct statement of the Assets and Liabilities of said Corporation, as of December 31, 2022, to the best of my knowledge and belief.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of said Corporation at Seattle, Washington, this 8th day of March 2023.

T. Mikolajewski

Assistant Secretary

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE**

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

TABLE OF CONTENTS

<u>CLASSIFICATION</u>	<u>PAGE</u>
ASBESTOS HANDLER	5
BLASTER	5
BOILERMAKER.....	6
BRICKLAYER.....	7
CARPENTER - BUILDING COMMERCIAL	8
CARPENTER - HEAVY CONSTRUCTION WORK	9
CARPENTER - HIGH RISE CONCRETE FORMS	10
CARPENTER - SIDEWALK SHED, SCAFFOLD AND HOIST.....	11
CARPENTER - WOOD WATER STORAGE TANK	12
CEMENT & CONCRETE WORKER.....	13
CEMENT MASON	14
CORE DRILLER	14
DERRICKPERSON AND RIGGER	16
DIVER	17
DOCKBUILDER - PILE DRIVER.....	18
DRIVER: TRUCK (TEAMSTER)	19
ELECTRICIAN	21
ELECTRICIAN - ALARM TECHNICIAN.....	25
ELECTRICIAN-STREET LIGHTING WORKER	26
ELEVATOR CONSTRUCTOR	27
ELEVATOR REPAIR & MAINTENANCE.....	28
ENGINEER	29
ENGINEER - CITY SURVEYOR AND CONSULTANT.....	34
ENGINEER - FIELD (BUILDING CONSTRUCTION)	35
ENGINEER - FIELD (HEAVY CONSTRUCTION)	36
ENGINEER - FIELD (STEEL ERECTION)	37
ENGINEER - OPERATING	38
FLOOR COVERER	46
GLAZIER	47
GLAZIER - REPAIR & MAINTENANCE	48
HAZARDOUS MATERIAL HANDLER.....	48
HEAT AND FROST INSULATOR	49
HOUSE WRECKER	50
IRON WORKER - ORNAMENTAL.....	51
IRON WORKER - STRUCTURAL.....	52
LABORER	53
LANDSCAPING	54

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE**

MARBLE MECHANIC.....	55
MASON TENDER	57
MASON TENDER (INTERIOR DEMOLITION WORKER)	58
METALLIC LATHER.....	59
MILLWRIGHT	59
MOSAIC MECHANIC.....	60
PAINTER	61
PAINTER - LINE STRIPING (ROADWAY).....	62
PAINTER - METAL POLISHER	63
PAINTER - SIGN.....	65
PAINTER - STRUCTURAL STEEL.....	65
PAPERHANGER	66
PAVER AND ROADBUILDER	67
PLASTERER	69
PLASTERER - TENDER.....	70
PLUMBER	71
PLUMBER (MECHNICAL EQUIPMENT AND SERVICE).....	72
PLUMBER (RESIDENTIAL RATES FOR 1, 2 AND 3 FAMILY HOME CONSTRUCTION).....	72
PLUMBER: PUMP & TANK.....	73
POINTER, WATERPROOFER, CAULKER, SANDBLASTER, STEAMBLASTER	74
ROOFER.....	75
SHEET METAL WORKER.....	75
SHEET METAL WORKER - SPECIALTY	77
SHIPYARD WORKER.....	78
SIGN ERECTOR.....	79
STEAMFITTER	80
STEAMFITTER - REFRIGERATION AND AIR CONDITIONER	81
STONE MASON - SETTER.....	82
TAPER.....	82
TELECOMMUNICATION WORKER	83
TILE FINISHER.....	84
TILE LAYER - SETTER	85
TIMBERPERSON	86
TUNNEL WORKER	87
UTILITY LOCATOR	89
WELDER.....	90

ASBESTOS HANDLER SEE HAZARDOUS MATERIAL HANDLER

BLASTER

Blaster

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$57.21**

Supplemental Benefit Rate per Hour: **\$50.43**

Blaster - Hydraulic Trac Drill

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$51.35**

Supplemental Benefit Rate per Hour: **\$50.43**

Blaster - Wagon: Air Trac: Quarry Bar: Drillrunners

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$50.02**

Supplemental Benefit Rate per Hour: **\$50.43**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$44.00**

Supplemental Benefit Rate per Hour: **\$50.43**

Blaster - Magazine Keepers: (Watch Person)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$22.00**

Supplemental Benefit Rate per Hour: **\$50.43**

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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$64.38**

Supplemental Benefit Rate per Hour: **\$47.35**

Supplemental Note: For time and one half overtime - \$70.58 For double overtime - \$93.80

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$58.23**

Supplemental Benefit Rate per Hour: **\$37.75**

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$55.05**

Supplemental Benefit Rate per Hour: **\$47.83**

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$58.16**

Supplemental Benefit Rate per Hour: **\$54.26**

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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

(Carpenters District Council)

CARPENTER - HIGH RISE CONCRETE FORMS (Excludes Engineered Structures and Building Foundations)

Carpenter High Rise A

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$50.78**

Supplemental Benefit Rate per Hour: **\$44.44**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$40.19**

Supplemental Benefit Rate per Hour: **\$17.75**

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$53.00**

Supplemental Benefit Rate per Hour: **\$47.65**

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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

(Carpenters District Council)

CARPENTER - WOOD WATER STORAGE TANK

Tank Mechanic

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$36.42**

Supplemental Benefit Rate per Hour: **\$23.10**

Tank Helper

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$28.76**

Supplemental Benefit Rate per Hour: **\$23.10**

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.

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

Cement & Concrete Worker

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$46.28**

Supplemental Benefit Rate per Hour: **\$30.20**

Supplemental Note: \$34.20 on Saturdays; \$38.20 on Sundays & Holidays

Cement & Concrete Worker - (Hired after 2/6/2016)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$35.80**

Supplemental Benefit Rate per Hour: **\$22.20**

Supplemental Note: \$24.20 on Saturdays; \$26.20 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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$46.77**

Supplemental Benefit Rate per Hour: **\$41.01**

Supplemental Note: Supplemental benefit time and one half rate: \$71.97; 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

Core Driller

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2022 - 10/17/2022

Wage Rate per Hour: **\$42.54**

Supplemental Benefit Rate per Hour: **\$30.60**

Effective Period: 10/18/2022 - 6/30/2023

Wage Rate per Hour: **\$43.88**

Supplemental Benefit Rate per Hour: **\$31.35**

Core Driller Helper

Effective Period: 7/1/2022 - 10/17/2022

Wage Rate per Hour: **\$33.47**

Supplemental Benefit Rate per Hour: **\$30.60**

Effective Period: 10/18/2022 - 6/30/2023

Wage Rate per Hour: **\$34.47**

Supplemental Benefit Rate per Hour: **\$31.35**

Core Driller Helper(Third year in the industry)

Effective Period: 7/1/2022 - 10/17/2022

Wage Rate per Hour: **\$30.12**

Supplemental Benefit Rate per Hour: **\$30.60**

Effective Period: 10/18/2022 - 6/30/2023

Wage Rate per Hour: **\$31.02**

Supplemental Benefit Rate per Hour: **\$31.35**

Core Driller Helper (Second year in the industry)

Effective Period: 7/1/2022 - 10/17/2022

Wage Rate per Hour: **\$26.78**

Supplemental Benefit Rate per Hour: **\$30.60**

Effective Period: 10/18/2022 - 6/30/2023

Wage Rate per Hour: **\$27.58**

Supplemental Benefit Rate per Hour: **\$31.35**

Core Driller Helper (First year in the industry)

Effective Period: 7/1/2022 - 10/17/2022

Wage Rate per Hour: **\$23.43**

Supplemental Benefit Rate per Hour: **\$30.60**

Effective Period: 10/18/2022 - 6/30/2023

Wage Rate per Hour: **\$24.13**

Supplemental Benefit Rate per Hour: **\$31.35**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$57.76**

Supplemental Benefit Rate per Hour: **\$56.24**

Derrick Person & Rigger - Site Work

Assists the Stone Mason-Setter in the setting of stone and paving stone.

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$46.20**

Supplemental Benefit Rate per Hour: **\$44.97**

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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$73.03**

Supplemental Benefit Rate per Hour: **\$54.26**

Diver Tender (Marine)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$52.57**

Supplemental Benefit Rate per Hour: **\$54.26**

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$58.16**

Supplemental Benefit Rate per Hour: **\$54.26**

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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.

(Carpenters District Council)

DRIVER: TRUCK (TEAMSTER)

Driver - Dump Truck

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$44.17**

Supplemental Benefit Rate per Hour: **\$53.95**

Supplemental Note: Over 40 hours worked: at time and one half rate - \$24.00; at double time rate - \$32.00

Driver - Tractor Trailer

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$47.32**

Supplemental Benefit Rate per Hour: **\$52.40**

Supplemental Note: Over 40 hours worked: at time and one half rate - \$23.25; at double time rate - \$31.00

Driver - Euclid & Turnapull Operator

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$47.88**

Supplemental Benefit Rate per Hour: **\$52.40**

Supplemental Note: Over 40 hours worked: at time and one half rate - \$23.25; at double time rate - \$31.00

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

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Veteran's Day
Thanksgiving Day
Day after Thanksgiving
Christmas Day

Paid Holidays

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

Off shift work commencing between 6:00 P.M. and 4:30 A.M. shall work eight and one half (8 1/2) hours allowing for one half hour for lunch and receive 9 hours pay for 8 hours of work.

Driver Redi-Mix (Sand & Gravel)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$40.89**

Supplemental Benefit Rate per Hour: **\$47.85**

Supplemental Note: Over 40 hours worked: time and one half rate \$18.68; double time rate \$24.90

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).

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Labor Day
Thanksgiving Day
Christmas Day

Paid Holidays

New Year's 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: 7/1/2022 - 4/12/2023

Wage Rate per Hour: **\$59.00**

Supplemental Benefit Rate per Hour: **\$57.84**

* Supplemental Note: See Supplemental Benefit Rate per Hour Note below

Effective Period: 4/13/2023 - 6/30/2023

Wage Rate per Hour: **\$61.00**

Supplemental Benefit Rate per Hour: **\$60.06**

* 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: 7/1/2022 - 4/12/2023

Wage Rate per Hour: **\$88.50**

Supplemental Benefit Rate per Hour: **\$59.74**

* Supplemental Note: See Supplemental Benefit Rate per Hour Note below

Effective Period: 4/13/2023 - 6/30/2023

Wage Rate per Hour: **\$91.50**

Supplemental Benefit Rate per Hour: **\$62.02**

* Supplemental Note: See Supplemental Benefit Rate per Hour Note below

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Electrician "A" (Swing Shift)

Effective Period: 7/1/2022 - 4/12/2023

Wage Rate per Hour: **\$69.23**

Supplemental Benefit Rate per Hour: **\$65.68**

* Supplemental Note: See Supplemental Benefit Rate per Hour Note below

Effective Period: 4/13/2023 - 6/30/2023

Wage Rate per Hour: **\$71.57**

Supplemental Benefit Rate per Hour: **\$68.14**

* Supplemental Note: See Supplemental Benefit Rate per Hour Note below

Electrician "A" (Swing Shift Overtime after 7.5 hours)

Effective Period: 7/1/2022 - 4/12/2023

Wage Rate per Hour: **\$103.85**

Supplemental Benefit Rate per Hour: **\$67.90**

* Supplemental Note: See Supplemental Benefit Rate per Hour Note below

Effective Period: 4/13/2023 - 6/30/2023

Wage Rate per Hour: **\$107.36**

Supplemental Benefit Rate per Hour: **\$70.45**

* Supplemental Note: See Supplemental Benefit Rate per Hour Note below

Electrician "A" (Graveyard Shift)

Effective Period: 7/1/2022 - 4/12/2023

Wage Rate per Hour: **\$77.54**

Supplemental Benefit Rate per Hour: **\$72.31**

* Supplemental Note: See Supplemental Benefit Rate per Hour Note below

Effective Period: 4/13/2023 - 6/30/2023

Wage Rate per Hour: **\$80.17**

Supplemental Benefit Rate per Hour: **\$74.99**

* Supplemental Note: See Supplemental Benefit Rate per Hour Note below

Electrician "A" (Graveyard Shift Overtime after 7 hours)

Effective Period: 7/1/2022 - 4/12/2023

Wage Rate per Hour: **\$116.31**

Supplemental Benefit Rate per Hour: **\$74.80**

Effective Period: 4/13/2023 - 6/30/2023

Wage Rate per Hour: **\$120.26**

Supplemental Benefit Rate per Hour: **\$77.57**

* 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

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE**

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: 7/1/2022 - 4/12/2023

Wage Rate per Hour: **\$31.25**

Supplemental Benefit Rate per Hour: **\$25.30**

First and Second Year "M" Wage Rate Per Hour: **\$26.75**

First and Second Year "M" Supplemental Rate: **\$22.88**

Effective Period: 4/13/2023 - 6/30/2023

Wage Rate per Hour: **\$31.25**

Supplemental Benefit Rate per Hour: **\$26.55**

First and Second Year "M" Wage Rate Per Hour: **\$26.75**

First and Second Year "M" Supplemental Rate: **\$24.13**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 4/12/2023

Wage Rate per Hour: **\$46.88**

Supplemental Benefit Rate per Hour: **\$27.28**

First and Second Year "M" Wage Rate Per Hour: **\$40.13**

First and Second Year "M" Supplemental Rate: **\$24.57**

Effective Period: 4/13/2023 - 6/30/2023

Wage Rate per Hour: **\$46.88**

Supplemental Benefit Rate per Hour: **\$28.53**

First and Second Year "M" Wage Rate Per Hour: **\$40.13**

First and Second Year "M" Supplemental Rate: **\$25.82**

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: 7/1/2022 - 3/8/2023

Wage Rate per Hour: **\$35.40**

Supplemental Benefit Rate per Hour: **\$19.79**

Supplemental Note: \$17.91 only after 8 hours worked in a day

Effective Period: 3/9/2023 - 6/30/2023

Wage Rate per Hour: **\$36.40**

Supplemental Benefit Rate per Hour: **\$20.67**

Supplemental Note: \$18.80 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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 4/19/2023

Wage Rate per Hour: **\$59.00**

Supplemental Benefit Rate per Hour: **\$59.85**

Effective Period: 4/20/2023 - 6/30/2023

Wage Rate per Hour: **\$61.00**

Supplemental Benefit Rate per Hour: **\$62.13**

* Supplemental Note: See Supplemental Benefit Rate per Hour Note below

Electrician - Electro Pole Foundation Installer

Effective Period: 7/1/2022 - 4/18/2023

Wage Rate per Hour: **\$44.66**

Supplemental Benefit Rate per Hour: **\$45.27**

Effective Period: 4/20/2023 - 6/30/2023

Wage Rate per Hour: **\$46.66**

Supplemental Benefit Rate per Hour: **\$47.16**

* Supplemental Note: See Supplemental Benefit Rate per Hour Note below

Electrician - Electro Pole Maintainer

Effective Period: 7/1/2022 - 4/18/2023

Wage Rate per Hour: **\$38.61**

Supplemental Benefit Rate per Hour: **\$41.00**

Effective Period: 4/20/2023 - 6/30/2023

Wage Rate per Hour: **\$40.61**

Supplemental Benefit Rate per Hour: **\$42.88**

* 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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 3/16/2023

Wage Rate per Hour: **\$75.14**

Supplemental Benefit Rate per Hour: **\$39.11**

Effective Period: 3/17/2023 - 6/30/2023

Wage Rate per Hour: **\$77.49**

Supplemental Benefit Rate per Hour: **\$40.62**

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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 3/16/2023

Wage Rate per Hour: **\$59.09**

Supplemental Benefit Rate per Hour: **\$39.01**

Effective Period: 3/17/2023 - 6/30/2023

Wage Rate per Hour: **\$60.89**

Supplemental Benefit Rate per Hour: **\$40.52**

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

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE**

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

Cherry pickers 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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$74.86**

Supplemental Benefit Rate per Hour: **\$44.72**

Supplemental Note: \$82.04 on overtime

Shift Wage Rate: **\$119.78**

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, Cherry pickers. 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

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE**

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 man auger.

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$72.55

Supplemental Benefit Rate per Hour: \$44.72

Supplemental Note: \$82.04 on overtime

Shift Wage Rate: \$116.08

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$68.68

Supplemental Benefit Rate per Hour: \$44.72

Supplemental Note: \$82.04 on overtime

Shift Wage Rate: \$109.89

Engineer - Heavy Construction Maintenance Engineer I

Installing, Repairing, Maintaining, Dismantling and Manning 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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$72.19

Supplemental Benefit Rate per Hour: \$44.72

Supplemental Note: \$82.04 on overtime

Shift Wage Rate: \$115.50

Engineer - Heavy Construction Maintenance Engineer II

On Base Mounted Tower Cranes

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$95.74

Supplemental Benefit Rate per Hour: \$44.72

Supplemental Note: \$82.04 on overtime

Shift Wage Rate: \$153.18

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Engineer - Heavy Construction Maintenance Engineer III

On Generators, Light Towers

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$46.62**

Supplemental Benefit Rate per Hour: **\$44.72**

Supplemental Note: \$82.04 on overtime

Shift Wage Rate: **\$74.59**

Engineer - Heavy Construction Maintenance Engineer IV

On Pumps and Mixers including mud sucking

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$47.90**

Supplemental Benefit Rate per Hour: **\$44.72**

Supplemental Note: \$82.04 on overtime

Shift Wage Rate: **\$76.64**

Engineer - Heavy Construction Service Engineer

Gradalls: Concrete Pumps: Power Houses: Driving Truck Cranes: Driving and Operating Fuel and Grease Trucks.

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$64.78**

Supplemental Benefit Rate per Hour: **\$44.72**

Supplemental Note: \$82.04 on overtime

Shift Wage Rate: **\$103.65**

Engineer - Heavy Construction Service Mechanic

Shovels: Cranes: Draglines: Backhoes: Keystones: Pavers: Trenching Machines: Guniting 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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$43.90**

Supplemental Benefit Rate per Hour: **\$44.72**

Supplemental Note: \$82.04 on overtime

Shift Wage Rate: **\$70.24**

Engineer - Steel Erection Maintenance Engineers

Derrick, Travelers, Tower, Crawler Tower and Climbing Cranes

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$69.19**

Supplemental Benefit Rate per Hour: **\$44.72**

Supplemental Note: \$82.04 on overtime

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Shift Wage Rate: **\$110.70**

Engineer - Steel Erection Oiler I

On a Truck Crane

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$64.57**

Supplemental Benefit Rate per Hour: **\$44.72**

Supplemental Note: \$82.04 on overtime

Shift Wage Rate: **\$103.31**

Engineer - Steel Erection Oiler II

On a Crawler Crane

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$48.44**

Supplemental Benefit Rate per Hour: **\$44.72**

Supplemental Note: \$82.04 on overtime

Shift Wage Rate: **\$77.50**

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

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

Engineer - Building Work Maintenance Engineers I

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$64.47**

Supplemental Benefit Rate per Hour: **\$43.81**

Supplemental Note: \$80.22 on overtime

Engineer - Building Work Maintenance Engineers II

On Pumps, Generators, Mixers and Heaters

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$49.42**

Supplemental Benefit Rate per Hour: **\$43.81**

Supplemental Note: \$80.22 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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$61.15**

Supplemental Benefit Rate per Hour: **\$43.81**

Supplemental Note: \$80.22 on overtime

Engineer - Building Work Oilers II

Oilers on Crawler Cranes, Backhoes, Trenching Machines, Guniting Machines, Compressors (three or more in Battery).

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$44.68**

Supplemental Benefit Rate per Hour: **\$43.81**

Supplemental Note: \$80.22 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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$42.49**

Supplemental Benefit Rate per Hour: **\$25.50**

Supplemental Note: Overtime Benefit Rate - \$30.50 per hour (time & one half) \$35.50 per hour (double time).

Instrument Person

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$34.64**

Supplemental Benefit Rate per Hour: **\$25.50**

Supplemental Note: Overtime Benefit Rate - \$30.50 per hour (time & one half) \$35.50 per hour (double time).

Rodperson

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$29.69**

Supplemental Benefit Rate per Hour: **\$25.50**

Supplemental Note: Overtime Benefit Rate - \$30.50 per hour (time & one half) \$35.50 per hour (double time).

Overtime Description

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$66.46**

Supplemental Benefit Rate per Hour: **\$40.09**

Supplemental Note: Overtime Benefit Rate - \$56.54 per hour (time & one half) \$72.98 per hour (double time).

Field Engineer - BC Instrument Person

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$50.97**

Supplemental Benefit Rate per Hour: **\$40.09**

Supplemental Note: Overtime Benefit Rate - \$56.54 per hour (time & one half) \$72.98 per hour (double time).

Field Engineer - BC Rodperson

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$31.90**

Supplemental Benefit Rate per Hour: **\$40.09**

Supplemental Note: Overtime Benefit Rate - \$56.54 per hour (time & one half) \$72.98 per hour (double time).

Overtime Description

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$77.31**

Supplemental Benefit Rate per Hour: **\$42.52**

Supplemental Note: Overtime benefit rate - \$60.06 per hour (time & one half), \$77.60 per hour (double time).

Field Engineer - HC Instrument Person

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$55.97**

Supplemental Benefit Rate per Hour: **\$42.52**

Supplemental Note: Overtime benefit rate - \$60.06 per hour (time & one half), \$77.60 per hour (double time).

Field Engineer - HC Rodperson

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$46.47**

Supplemental Benefit Rate per Hour: **\$42.52**

Supplemental Note: Overtime benefit rate - \$60.06 per hour (time & one half), \$77.60 per hour (double time).

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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
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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$71.98

Supplemental Benefit Rate per Hour: \$42.07

Supplemental Note: Overtime benefit rate - \$59.38 per hour (time & one half), \$76.69 per hour (double time).

Field Engineer - Steel Erection Instrument Person

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$55.42

Supplemental Benefit Rate per Hour: \$42.07

Supplemental Note: Overtime benefit rate - \$59.38 per hour (time & one half), \$76.69 per hour (double time).

Field Engineer - Steel Erection Rodperson

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$36.05

Supplemental Benefit Rate per Hour: \$42.07

Supplemental Note: Overtime benefit rate - \$59.38 per hour (time & one half), \$76.69 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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$88.32**

Supplemental Benefit Rate per Hour: **\$35.30**

Supplemental Note: \$64.40 overtime hours

Shift Wage Rate: **\$141.31**

Operating Engineer - Road & Heavy Construction II

Backhoes, Power Shovels, Hydraulic Clam Shells, Steel Erection, Moles and machines of a similar nature.

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$91.40**

Supplemental Benefit Rate per Hour: **\$35.30**

Supplemental Note: \$64.40 overtime hours

Shift Wage Rate: **\$146.24**

Operating Engineer - Road & Heavy Construction III

Mine Hoists (Cranes, etc. when used as Mine Hoists)

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE**

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$94.31

Supplemental Benefit Rate per Hour: \$35.30

Supplemental Note: \$64.40 overtime hours

Shift Wage Rate: \$150.90

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$92.06

Supplemental Benefit Rate per Hour: \$35.30

Supplemental Note: \$64.40 overtime hours

Shift Wage Rate: \$147.30

Operating Engineer - Road & Heavy Construction V

Pile Drivers & Rigs (working alongside Dock Builder foreperson): Derrick Boats, Tunnel Shovels.

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$90.26

Supplemental Benefit Rate per Hour: \$35.30

Supplemental Note: \$64.40 overtime hours

Shift Wage Rate: \$144.42

Operating Engineer - Road & Heavy Construction VI

Mixers (Concrete with loading attachment), Concrete Pavers, Cableways, Land Derricks, Power Houses (Low Air Pressure Units).

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$85.80

Supplemental Benefit Rate per Hour: \$35.30

Supplemental Note: \$64.40 overtime hours

Shift Wage Rate: \$137.28

Operating Engineer - Road & Heavy Construction VII

Barrier Movers, Barrier Transport and Machines of a Similar Nature.

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$69.52

Supplemental Benefit Rate per Hour: \$35.30

Supplemental Note: \$64.40 overtime hours

Shift Wage Rate: \$111.23

Operating Engineer - Road & Heavy Construction VIII

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE**

Utility Compressors

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$54.21

Supplemental Benefit Rate per Hour: \$35.30

Supplemental Note: \$64.40 overtime hours

Shift Wage Rate: \$68.04

Operating Engineer - Road & Heavy Construction IX

Horizontal Boring Rig

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$81.67

Supplemental Benefit Rate per Hour: \$35.30

Supplemental Note: \$64.40 overtime hours

Shift Wage Rate: \$130.67

Operating Engineer - Road & Heavy Construction X

Elevators (manually operated as personnel hoist).

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$75.16

Supplemental Benefit Rate per Hour: \$35.30

Supplemental Note: \$64.40 overtime hours

Shift Wage Rate: \$120.26

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$58.61

Supplemental Benefit Rate per Hour: \$35.30

Supplemental Note: \$64.40 overtime hours

Shift Wage Rate: \$93.78

Operating Engineer - Road & Heavy Construction XII

All Drills and Machines of a similar nature.

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$86.71

Supplemental Benefit Rate per Hour: \$35.30

Supplemental Note: \$64.40 overtime hours

Shift Wage Rate: \$138.74

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Operating Engineer - Road & Heavy Construction XIII

Concrete Pumps, Concrete Plant, Stone Crushers, Double Drum Hoist, Power Houses (other than above).

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$84.02**

Supplemental Benefit Rate per Hour: **\$35.30**

Supplemental Note: \$64.40 overtime hours

Shift Wage Rate: **\$134.43**

Operating Engineer - Road & Heavy Construction XIV

Concrete Mixer

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$80.36**

Supplemental Benefit Rate per Hour: **\$35.30**

Supplemental Note: \$64.40 overtime hours

Shift Wage Rate: **\$128.58**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$54.56**

Supplemental Benefit Rate per Hour: **\$35.30**

Supplemental Note: \$64.40 overtime hours

Shift Wage Rate: **\$87.30**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$76.80**

Supplemental Benefit Rate per Hour: **\$35.30**

Supplemental Note: \$64.40 overtime hours

Shift Wage Rate: **\$122.88**

Operating Engineer - Road & Heavy Construction XVII

On-Site concrete plant engineer, On-site Asphalt Plant Engineer, and Vibratory console.

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$77.36**

Supplemental Benefit Rate per Hour: **\$35.30**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Supplemental Note: \$64.40 overtime hours
Shift Wage Rate: \$123.78

Operating Engineer - Road & Heavy Construction XVIII

Tower Crane

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: \$110.56
Supplemental Benefit Rate per Hour: \$35.30
Supplemental Note: \$64.40 overtime hours
Shift Wage Rate: \$176.90

Operating Engineer - Paving I

Asphalt Spreaders, Autogrades (C.M.I.), Roto/Mil

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: \$85.80
Supplemental Benefit Rate per Hour: \$35.30
Supplemental Note: \$64.40 overtime hours
Shift Wage Rate: \$137.28

Operating Engineer - Paving II

Asphalt Roller

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: \$83.63
Supplemental Benefit Rate per Hour: \$35.30
Supplemental Note: \$64.40 overtime hours
Shift Wage Rate: \$133.81

Operating Engineer - Paving III

Asphalt Plants

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: \$70.88
Supplemental Benefit Rate per Hour: \$35.30
Supplemental Note: \$64.40 overtime hours
Shift Wage Rate: \$113.41

Operating Engineer - Concrete I

Cranes

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: \$91.66

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: **\$35.30**
Supplemental Note: \$64.40 overtime hours

Operating Engineer - Concrete II

Compressors

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **\$54.97**
Supplemental Benefit Rate per Hour: **\$35.30**
Supplemental Note: \$64.40 overtime hours

Operating Engineer - Concrete III

Micro-traps (Negative Air Machines), Vac-All Remediation System.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **\$73.46**
Supplemental Benefit Rate per Hour: **\$35.30**
Supplemental Note: \$64.40 overtime hours

Operating Engineer - Steel Erection I

Three Drum Derricks

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **\$95.02**
Supplemental Benefit Rate per Hour: **\$35.30**
Supplemental Note: \$64.40 overtime hours
Shift Wage Rate: **\$152.03**

Operating Engineer - Steel Erection II

Cranes, 2 Drum Derricks, Hydraulic Cranes, Fork Lifts and Boom Trucks.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **\$91.33**
Supplemental Benefit Rate per Hour: **\$35.30**
Supplemental Note: \$64.40 overtime hours
Shift Wage Rate: **\$146.13**

Operating Engineer - Steel Erection III

Compressors, Welding Machines.

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **\$54.68**
Supplemental Benefit Rate per Hour: **\$35.30**
Supplemental Note: \$64.40 overtime hours
Shift Wage Rate: **\$87.49**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Operating Engineer - Steel Erection IV

Compressors - Not Combined with Welding Machine. (Public Works Only)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$52.10**

Supplemental Benefit Rate per Hour: **\$35.30**

Supplemental Note: \$64.40 overtime hours

Shift Wage Rate: **\$83.36**

Operating Engineer - Building Work I

Forklifts, Plaster (Platform machine), Plaster Bucket, Concrete Pump and all other equipment used for hoisting material.

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$73.28**

Supplemental Benefit Rate per Hour: **\$35.30**

Supplemental Note: \$64.40 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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$54.94**

Supplemental Benefit Rate per Hour: **\$35.30**

Supplemental Note: \$64.40 overtime hours

Operating Engineer - Building Work III

Double Drum

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$86.78**

Supplemental Benefit Rate per Hour: **\$35.30**

Supplemental Note: \$64.40 overtime hours

Operating Engineer - Building Work IV

Stone Derrick, Cranes, Hydraulic Cranes Boom Trucks.

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$91.86**

Supplemental Benefit Rate per Hour: **\$35.30**

Supplemental Note: \$64.40 overtime hours

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Operating Engineer - Building Work V

Dismantling and Erection of Cranes, Relief Engineer.

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$81.38**

Supplemental Benefit Rate per Hour: **\$35.30**

Supplemental Note: \$64.40 overtime hours

Operating Engineer - Building Work VI

4 Pole Hoist, Single Drum Hoists.

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$80.52**

Supplemental Benefit Rate per Hour: **\$35.30**

Supplemental Note: \$64.40 overtime hours

Operating Engineer - Building Work VII

Rack & Pinion and House Cars

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$64.09**

Supplemental Benefit Rate per Hour: **\$35.30**

Supplemental Note: \$64.40 overtime hours

For New House Car projects Wage Rate per Hour **\$51.21**

For New House Car projects: Supplemental Benefit overtime hours: **\$49.85**

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

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE**

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

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)

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$55.05**

Supplemental Benefit Rate per Hour: **\$47.83**

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$46.55**

Supplemental Benefit Rate per Hour: **\$50.04**

Supplemental Note: Supplemental Benefit Overtime Rate: \$75.07

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

Thanksgiving Day

Day after Thanksgiving

Christmas Day

Paid Holidays

None

Shift Rates

Shifts shall be any 8 consecutive hours after the normal working day for which the Glazier shall receive 9 hours pay for 8 hours worked.

(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, Residential glass replacement, Residential mirrors and shower doors, Storm windows and storm doors, Residential replacement windows, Herculite door repairs, Door closer repairs, Retrofit apartment house (non-commercial buildings), Glass tinting.

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$26.40**

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 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: 7/1/2022 - 7/3/2022

Wage Rate per Hour: **\$38.05**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: **\$19.10**

Effective Period: 7/4/2022 - 6/30/2023

Wage Rate per Hour: **\$38.05**

Supplemental Benefit Rate per Hour: **\$19.60**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$62.71**

Supplemental Benefit Rate per Hour: **\$41.91**

Overtime Description

Double time shall be paid for supplemental benefits during overtime work.

8th hour paid at time and one half.

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).

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$38.23**

Supplemental Benefit Rate per Hour: **\$30.97**

House Wrecker - Tier B

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$27.46**

Supplemental Benefit Rate per Hour: **\$23.38**

Overtime

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$46.65**

Supplemental Benefit Rate per Hour: **\$61.62**

Supplemental Note: Supplemental benefits are to be paid at the applicable overtime rate when overtime is in effect.

Overtime Description

Time and one half the regular rate after a 7 hour day for a maximum of two hours on any regular work day (the 8th and 9th hour) and double time shall be paid for all work on a regular work day thereafter, time and one half the regular rate for Saturday for the first seven hours of work and double time shall be paid for all work on a Saturday thereafter.

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Paid Holidays

None

Shift Rates

When two or three shifts are employed on a job, Monday through Friday, the second and third shift are paid eight and one half (8 ½) hours at the straight time rate for seven (7) hours of work, and ten (10) hours at the straight time rate for eight (8) hours of work. 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, and all overtime shall be paid at time and one-half the regular straight time rates but on 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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$55.70**

Supplemental Benefit Rate per Hour: **\$84.79**

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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

(Foundation, Concrete, Excavating, Street Pipe Layer and Common)

Laborer

Excavation and foundation work for buildings, heavy construction, 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.

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$44.00**

Supplemental Benefit Rate per Hour: **\$50.43**

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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)

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$35.06**

Supplemental Benefit Rate per Hour: **\$17.55**

Landscaper (Year 3 - 5)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$33.93**

Supplemental Benefit Rate per Hour: **\$17.55**

Landscaper (up to 3 years)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$31.09**

Supplemental Benefit Rate per Hour: **\$17.55**

Groundperson

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$31.09**

Supplemental Benefit Rate per Hour: **\$17.55**

Tree Remover / Pruner

Effective Period: 7/1/2022 - 6/30/2023

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Wage Rate per Hour: **\$40.76**

Supplemental Benefit Rate per Hour: **\$17.55**

Landscaper Sprayer (Pesticide Applicator)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$29.39**

Supplemental Benefit Rate per Hour: **\$17.55**

Watering - Plant Maintainer

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$23.68**

Supplemental Benefit Rate per Hour: **\$17.55**

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: 7/1/2022 - 7/3/2022

Wage Rate per Hour: **\$57.17**

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE**

Supplemental Benefit Rate per Hour: \$42.26

Effective Period: 7/4/2022 - 6/30/2023

Wage Rate per Hour: \$57.40

Supplemental Benefit Rate per Hour: \$42.66

Marble Finisher

Effective Period: 7/1/2022 - 7/3/2022

Wage Rate per Hour: \$44.42

Supplemental Benefit Rate per Hour: \$39.46

Effective Period: 7/4/2022 - 6/30/2023

Wage Rate per Hour: \$44.65

Supplemental Benefit Rate per Hour: \$39.76

Marble Polisher

Effective Period: 7/1/2022 - 7/3/2022

Wage Rate per Hour: \$43.35

Supplemental Benefit Rate per Hour: \$32.26

Effective Period: 7/4/2022 - 6/30/2023

Wage Rate per Hour: \$43.71

Supplemental Benefit Rate per Hour: \$32.46

Marble Maintenance Finisher

Effective Period: 7/1/2022 - 7/3/2022

Wage Rate per Hour: \$27.01

Supplemental Benefit Rate per Hour: \$13.99

Effective Period: 7/4/2022 - 6/30/2023

Wage Rate per Hour: \$27.17

Supplemental Benefit Rate per Hour: \$14.23

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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

Mason Tender

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$39.95**

Supplemental Benefit Rate per Hour: **\$31.99**

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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

(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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$37.69**

Supplemental Benefit Rate per Hour: **\$26.10**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$26.88**

Supplemental Benefit Rate per Hour: **\$20.42**

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)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

METALLIC LATHER

Metallic Lather

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$46.40**

Supplemental Benefit Rate per Hour: **\$51.30**

Supplemental Note: For time and one half overtime - \$63.05 For double overtime - \$79.10

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.

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$57.80**

Supplemental Benefit Rate per Hour: **\$55.96**

Overtime

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$52.75**

Supplemental Benefit Rate per Hour: **\$44.37**

Mosaic Mechanic - Mosaic & Terrazzo Finisher

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$51.14**

Supplemental Benefit Rate per Hour: **\$44.37**

Mosaic Mechanic - Machine Operator Grinder

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$51.14**

Supplemental Benefit Rate per Hour: **\$44.37**

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

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$43.00**

Supplemental Benefit Rate per Hour: **\$38.78**

Supplemental Note: \$46.62 on overtime

Spray & Scaffold / Decorative / Sandblast

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$46.00**

Supplemental Benefit Rate per Hour: **\$38.78**

Supplemental Note: \$46.62 on overtime

Overtime

Time and one half the regular rate after a 7 hour day.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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

Thanksgiving Day

Christmas Day

Paid Holidays

None

(District Council of Painters #9)

PAINTER - LINE STRIPING (ROADWAY)

Striping - Machine Operator

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$39.00**

Supplemental Benefit Rate per Hour: **\$15.27**

Supplemental Note: Overtime Supplemental Benefit rate - \$15.90

Lineperson (Thermoplastic)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$43.00**

Supplemental Benefit Rate per Hour: **\$15.27**

Supplemental Note: Overtime Supplemental Benefit rate - \$15.90

Striping Assistant & Traffic Safety

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$37.00**

Supplemental Benefit Rate per Hour: **\$15.27**

Supplemental Note: Overtime Supplemental Benefit rate - \$15.90

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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Overtime

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

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)

PAINTER - METAL POLISHER

METAL POLISHER

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$32.51

Supplemental Benefit Rate per Hour: \$10.92

METAL POLISHER - NEW CONSTRUCTION

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$33.46

Supplemental Benefit Rate per Hour: \$10.92

METAL POLISHER - SCAFFOLD OVER 34 FEET

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$36.01

Supplemental Benefit Rate per Hour: \$10.92

ASSISTANT METAL POLISHER

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$25.31**

Supplemental Benefit Rate per Hour: **\$10.44**

ASSISTANT METAL POLISHER - NEW CONSTRUCTION

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$26.26**

Supplemental Benefit Rate per Hour: **\$10.44**

ASSISTANT METAL POLISHER - SCAFFOLD OVER 34 FEET

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$27.81**

Supplemental Benefit Rate per Hour: **\$10.44**

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.

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.

Triple time 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

Four Days a week at Ten (10) hours straight a day.

Local 8A-28A

PAINTER - SIGN

Sign Painter

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$45.54**

Supplemental Benefit Rate per Hour: **\$22.29**

Assistant Sign Painter

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$38.70**

Supplemental Benefit Rate per Hour: **\$20.20**

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)

PAINTER - STRUCTURAL STEEL

Painters on Structural Steel

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$53.00**

Supplemental Benefit Rate per Hour: **\$49.83**

Painter - Power Tool

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$59.50**

Supplemental Benefit Rate per Hour: **\$49.83**

Overtime Wage Rate: **\$6.50** 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 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

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 in order to work a second shift.

(Local #806)

PAPERHANGER

Paperhanger

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$47.37**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: **\$39.06**

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.

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

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

Paver & Roadbuilder - Formsetter

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$48.35**

Supplemental Benefit Rate per Hour: **\$50.19**

Supplemental Note: For time and one half overtime - \$54.44 For double overtime - \$58.69

Paver & Roadbuilder - Laborer

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.

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE**

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$44.48

Supplemental Benefit Rate per Hour: \$50.19

Supplemental Note: For time and one half overtime - \$54.44 For double overtime - \$58.69

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$48.95

Supplemental Benefit Rate per Hour: \$50.19

Supplemental Note: For time and one half overtime - \$54.44 For double overtime - \$58.69

Production Paver & Roadbuilder - Raker

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$48.35

Supplemental Benefit Rate per Hour: \$50.19

Supplemental Note: For time and one half overtime - \$54.44 For double overtime - \$58.69

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$44.48

Supplemental Benefit Rate per Hour: \$50.19

Supplemental Note: For time and one half overtime - \$54.44 For double overtime - \$58.69

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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.

Night Work - On night work, the first eight (8) hours of work will be paid for at the single time rate, except that production paving work shall be paid at 10% over the single time rate for the screed person, rakers and shovelers directly involved only. This differential is to be paid when there is only one shift and the shift works at night. All other workers will be exempt. Hours worked over eight (8) hours during said shift shall be paid for at the time and one-half rate.

(Local #1010)

PLASTERER

Plasterer

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$47.03**

Supplemental Benefit Rate per Hour: **\$28.79**

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$39.95**

Supplemental Benefit Rate per Hour: **\$31.99**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$72.50**

Supplemental Benefit Rate per Hour: **\$41.45**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$58.08**

Supplemental Benefit Rate per Hour: **\$33.08**

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

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 (MECHANICAL EQUIPMENT AND SERVICE)

(Mechanical Equipment and Service work shall include any repair and/or replacement of the present plumbing system.)

Plumber

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$46.60**

Supplemental Benefit Rate per Hour: **\$19.96**

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

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$50.35**

Supplemental Benefit Rate per Hour: **\$29.73**

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

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$69.73**

Supplemental Benefit Rate per Hour: **\$28.48**

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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)

Journey person

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$58.83**

Supplemental Benefit Rate per Hour: **\$30.10**

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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.

(Bricklayer District Council)

ROOFER

Roofer

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$45.25**

Supplemental Benefit Rate per Hour: **\$37.56**

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

Sheet Metal Worker

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$52.10**

Supplemental Benefit Rate per Hour: **\$55.18**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$41.68**

Supplemental Benefit Rate per Hour: **\$55.18**

Sheet Metal Worker - Duct Cleaner

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$19.12**

Supplemental Benefit Rate per Hour: **\$12.01**

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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

(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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$49.05**

Supplemental Benefit Rate per Hour: **\$27.76**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$28.85**

Supplemental Benefit Rate per Hour: **\$3.93**

Shipyard Mechanic - Second Class

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$22.07**

Supplemental Benefit Rate per Hour: **\$3.79**

Shipyard Laborer - First Class

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$22.48**

Supplemental Benefit Rate per Hour: **\$3.77**

Shipyard Laborer - Second Class

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$17.93**

Supplemental Benefit Rate per Hour: **\$3.78**

Shipyard Dockhand - First Class

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$22.15**

Supplemental Benefit Rate per Hour: **\$3.70**

Shipyard Dockhand - Second Class

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$18.04**

Supplemental Benefit Rate per Hour: **\$3.61**

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$53.79**

Supplemental Benefit Rate per Hour: **\$59.56**

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.

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$61.30**

Supplemental Benefit Rate per Hour: **\$59.89**

Supplemental Note: Overtime supplemental benefit rate: \$119.04

Steamfitter -Temporary Services

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$46.59**

Supplemental Benefit Rate per Hour: **\$48.70**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$43.85**

Supplemental Benefit Rate per Hour: **\$19.96**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$57.16**

Supplemental Benefit Rate per Hour: **\$50.17**

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$48.47**

Supplemental Benefit Rate per Hour: **\$30.01**

Overtime

Time and one half the regular rate after a 7 hour day.

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE**

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

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus 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.

(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: 7/1/2022 - 6/30/2023

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

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$44.40**

Supplemental Benefit Rate per Hour: **\$35.56**

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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$57.41**

Supplemental Benefit Rate per Hour: **\$40.11**

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
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Columbus Day
Veteran's Day

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$53.05**

Supplemental Benefit Rate per Hour: **\$53.94**

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 #1536)

TUNNEL WORKER

Blasters, Mucking Machine Operators (Compressed Air Rates)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$68.58**

Supplemental Benefit Rate per Hour: **\$60.19**

Tunnel Workers (Compressed Air Rates)

Includes shield driven liner plate portions or solidification portions work (8 hour shift) during excavation phase.

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$66.14**

Supplemental Benefit Rate per Hour: **\$58.29**

Top Nipper (Compressed Air Rates)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$65.04**

Supplemental Benefit Rate per Hour: **\$57.14**

Outside Lock Tender, Outside Gauge Tender, Muck Lock Tender (Compressed Air Rates)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$63.74**

Supplemental Benefit Rate per Hour: **\$56.20**

Bottom Bell & Top Bell Signal Person: Shaft Person (Compressed Air Rates)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$63.74**

Supplemental Benefit Rate per Hour: **\$56.20**

Changehouse Attendant: Powder Watchperson (Compressed Air Rates)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$56.04**

Supplemental Benefit Rate per Hour: **\$52.83**

Blasters (Free Air Rates)

**OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE**

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$65.41

Supplemental Benefit Rate per Hour: \$57.80

Tunnel Workers (Free Air Rates)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$62.58

Supplemental Benefit Rate per Hour: \$55.38

All Others (Free Air Rates)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$57.84

Supplemental Benefit Rate per Hour: \$51.26

Microtunneling (Free Air Rates)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$50.06

Supplemental Benefit Rate per Hour: \$44.30

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 7 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

Lincoln's Birthday

President's Day

Memorial Day

Independence Day

Labor Day

Columbus Day

Election Day

Veteran's Day

Thanksgiving Day

Christmas Day

(Local #147)

UTILITY LOCATOR

(Locate & mark underground utilities for street excavation.)

Utility Locator (Year 7 and above)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$31.56**

Supplemental Benefit Rate per Hour: **\$1.43**

Utility Locator (Year 5 - 6)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$22.85**

Supplemental Benefit Rate per Hour: **\$1.43**

Utility Locator (Year 4)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$21.54**

Supplemental Benefit Rate per Hour: **\$1.43**

Utility Locator (Year 3)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$20.30**

Supplemental Benefit Rate per Hour: **\$1.43**

Utility Locator (Year 2)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$19.13**

Supplemental Benefit Rate per Hour: **\$1.43**

Utility Locator (Year 1)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$18.04**

Supplemental Benefit Rate per Hour: **\$1.43**

Utility Locator (Up to 1 year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$17.00**

Supplemental Benefit Rate per Hour: **\$1.43**

Supplemental Note: No benefits for the first 90 days of employment.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION WORKER PREVAILING WAGE SCHEDULE

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

TO BE PAID AT THE RATE OF THE JOURNEYPERSON 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.

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

TABLE OF CONTENTS

<u>CLASSIFICATION</u>	<u>PAGE</u>
BOILERMAKER.....	3
BRICKLAYER.....	4
CARPENTER.....	5
CARPENTER - HIGH RISE CONCRETE FORMS	5
CEMENT AND CONCRETE WORKER.....	6
CEMENT MASON.....	7
DERRICKPERSON & RIGGER (STONE).....	7
DOCKBUILDER/PILE DRIVER.....	8
ELECTRICIAN.....	9
ELEVATOR CONSTRUCTOR.....	10
ELEVATOR REPAIR & MAINTENANCE.....	11
ENGINEER.....	12
ENGINEER - OPERATING.....	13
FLOOR COVERER.....	14
GLAZIER.....	14
HAZARDOUS MATERIAL HANDLER.....	15
HEAT & FROST INSULATOR.....	16
HOUSE WRECKER.....	17
IRON WORKER - ORNAMENTAL.....	17
IRON WORKER - STRUCTURAL.....	18
LABORER (FOUNDATION, CONCRETE, EXCAVATING, STREET PIPE LAYER & COMMON).....	19
MARBLE MECHANICS.....	20
MASON TENDER.....	21
MASON TENDER (INTERIOR DEMOLITION WORKER).....	22
METALLIC LATHER.....	23
MILLWRIGHT.....	23
PAINTER.....	24
PAINTER - LINE STRIPING (ROADWAY).....	25
PAINTER - METAL POLISHER.....	25
PAINTER - STRUCTURAL STEEL.....	26
PAVER AND ROADBUILDER.....	26
PLASTERER.....	27
PLASTERER - TENDER.....	28
PLUMBER.....	28
POINTER, WATERPROOFER, CAULKER, SANDBLASTER, STEAMBLASTER.....	29
ROOFER.....	30
SHEET METAL WORKER.....	31
SIGN ERECTOR.....	32
STEAMFITTER.....	33
STEAMFITTER - REFRIGERATION & AIR CONDITIONER.....	34
STONE MASON - SETTER.....	35
TAPER.....	36
TILE LAYER - SETTER.....	36
TIMBERPERSON.....	38

BOILERMAKER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Boilermaker (First Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 65% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$33.57

Boilermaker (Second Year: 1st Six Months)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 70% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$35.54

Boilermaker (Second Year: 2nd Six Months)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 75% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$37.51

Boilermaker (Third Year: 1st Six Months)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 80% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$39.48

Boilermaker (Third Year: 2nd Six Months)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 85% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$41.45

Boilermaker (Fourth Year: 1st Six Months)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 90% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$43.42

Boilermaker (Fourth Year: 2nd Six Months)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 95% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$45.39

(Local #5)

BRICKLAYER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Bricklayer (First 750 Hours)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 50% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$23.85

Bricklayer (Second 750 Hours)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 60% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$23.85

Bricklayer (Third 750 Hours)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 70% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$23.85

Bricklayer (Fourth 750 Hours)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 80% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$23.85

Bricklayer (Fifth 750 Hours)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 90% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$23.85

Bricklayer (Sixth 750 Hours)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 95% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: \$23.85

(Bricklayer District Council)

CARPENTER

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

Carpenter (First Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour For Building Apprentice: \$19.80

Supplemental Benefit Rate Per Hour For Building Apprentice: \$16.85

Wage Rate Per Hour For Heavy Apprentice: \$24.60

Supplemental Benefit Rate Per Hour For Heavy Apprentice: \$36.26

Carpenter (Second Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour For Building Apprentice: \$22.80

Supplemental Benefit Rate Per Hour For Building Apprentice: \$18.35

Wage Rate Per Hour For Heavy Apprentice: \$30.20

Supplemental Benefit Rate Per Hour For Heavy Apprentice: \$36.26

Carpenter (Third Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour For Building Apprentice: \$27.05

Supplemental Benefit Rate Per Hour For Building Apprentice: \$21.95

Wage Rate Per Hour For Heavy Apprentice: \$38.58

Supplemental Benefit Rate Per Hour For Heavy Apprentice: \$36.26

Carpenter (Fourth Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour For Building Apprentice: \$34.93

Supplemental Benefit Rate Per Hour For Building Apprentice: \$23.95

Wage Rate Per Hour For Heavy Apprentice: \$46.97

Supplemental Benefit Rate Per Hour For Heavy Apprentice: \$36.26

(Carpenters District Council)

CARPENTER - HIGH RISE CONCRETE FORMS

(Ratio of Apprentice to Journeyman: 1 to 1, 2 to 5)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Carpenter - High Rise (First Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$18.27

Supplemental Benefit Rate per Hour: \$16.55

Carpenter - High Rise (Second Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$24.70

Supplemental Benefit Rate per Hour: \$17.68

Carpenter - High Rise (Third Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$31.28

Supplemental Benefit Rate per Hour: \$17.81

Carpenter - High Rise (Fourth Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$38.90

Supplemental Benefit Rate per Hour: \$17.96

(Carpenters District Council)

CEMENT AND CONCRETE WORKER
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Cement & Concrete Worker (First 1333 hours)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 53% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$14.79

Cement & Concrete Worker (Second 1333 hours)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 69% of Journeyman's rate

Supplemental Benefit Rate Per Hour: \$19.72

Cement & Concrete Worker (Last 1334 hours)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 85% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$21.30

(Cement Concrete Workers District Council)

CEMENT MASON
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

Cement Mason (First Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: \$19.92
Supplemental Benefit Rate per Hour: \$15.61

Cement Mason (Second Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: \$24.82
Supplemental Benefit Rate per Hour: \$15.91

Cement Mason (Third Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: \$30.22
Supplemental Benefit Rate per Hour: \$16.02

(Local #780)

DERRICKPERSON & RIGGER (STONE)
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

Derrickperson & Rigger (stone) - First Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 50% of Journeyman's rate
Supplemental Benefit Rate Per Hour: 50% of Journeyman's rate

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Derrickperson & Rigger (stone) - Second Year: 1st Six Months

Effective Period: 7/1/2022 - 6/30/2023

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: 7/1/2022 - 6/30/2023

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: 7/1/2022 - 6/30/2023

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: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: \$24.60

Supplemental Benefit Rate Per Hour: \$36.26

Dockbuilder/Pile Driver (Second Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: \$30.20

Supplemental Benefit Rate Per Hour: \$36.26

Dockbuilder/Pile Driver (Third Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: \$38.58

Supplemental Benefit Rate Per Hour: \$36.26

Dockbuilder/Pile Driver (Fourth Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: \$46.97

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate Per Hour: \$36.26

(Carpenters District Council)

ELECTRICIAN

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Electrician (First Term: 0-6 Months)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$18.00

Supplemental Benefit Rate per Hour: \$15.68

Overtime Supplemental Rate Per Hour: \$16.88

Electrician (First Term: 7-12 Months)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$18.50

Supplemental Benefit Rate per Hour: \$15.94

Overtime Supplemental Rate Per Hour: \$17.17

Electrician (Second Term: 0-6 Months)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$19.50

Supplemental Benefit Rate per Hour: \$16.47

Overtime Supplemental Rate Per Hour: \$17.76

Electrician (Second Term: 7-12 Months)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$20.50

Supplemental Benefit Rate per Hour: \$16.99

Overtime Supplemental Rate Per Hour: \$18.35

Electrician (Third Term: 0-6 Months)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$21.50

Supplemental Benefit Rate per Hour: \$17.52

Overtime Supplemental Rate Per Hour: \$18.94

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Electrician (Third Term: 7-12 Months)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$22.50**

Supplemental Benefit Rate per Hour: **\$18.04**

Overtime Supplemental Rate Per Hour: **\$19.53**

Electrician (Fourth Term: 0-6 Months)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$23.50**

Supplemental Benefit Rate per Hour: **\$18.56**

Overtime Supplemental Rate Per Hour: **\$20.12**

Electrician (Fourth Term: 7-12 Months)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$25.50**

Supplemental Benefit Rate per Hour: **\$19.61**

Overtime Supplemental Rate Per Hour: **\$21.30**

Electrician (Fifth Term: 0-12 Months)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$26.75**

Supplemental Benefit Rate per Hour: **\$22.88**

Overtime Supplemental Rate Per Hour: **\$24.57**

Electrician (Fifth Term: 13-18 Months)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$31.25**

Supplemental Benefit Rate per Hour: **\$25.30**

Overtime Supplemental Rate Per Hour: **\$27.28**

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)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Elevator (Constructor) - First Year

Effective Period: 7/1/2022 - 3/16/2023

Wage Rate Per Hour: 50% of Journeyperson's rate

Supplemental Rate Per Hour: \$33.38

Effective Period: 3/17/2023 - 6/30/2023

Wage Rate Per Hour: 50% of Journeyperson's rate

Supplemental Rate Per Hour: \$34.64

Elevator (Constructor) - Second Year

Effective Period: 7/1/2022 - 3/16/2023

Wage Rate Per Hour: 55% of Journeyperson's rate

Supplemental Rate Per Hour: \$33.96

Effective Period: 3/17/2023 - 6/30/2023

Wage Rate Per Hour: 55% of Journeyperson's rate

Supplemental Rate Per Hour: \$35.24

Elevator (Constructor) - Third Year

Effective Period: 7/1/2022 - 3/16/2023

Wage Rate Per Hour: 65% of Journeyperson's rate

Supplemental Rate Per Hour: \$35.10

Effective Period: 3/17/2023 - 6/30/2023

Wage Rate Per Hour: 65% of Journeyperson's rate

Supplemental Rate Per Hour: \$36.43

Elevator (Constructor) - Fourth Year

Effective Period: 7/1/2022 - 3/16/2023

Wage Rate Per Hour: 75% of Journeyperson's rate

Supplemental Rate Per Hour: \$36.24

Effective Period: 3/17/2023 - 6/30/2023

Wage Rate Per Hour: 75% of Journeyperson's rate

Supplemental Rate Per Hour: \$37.63

(Local #1)

ELEVATOR REPAIR & MAINTENANCE

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Elevator Service/Modernization Mechanic (First Year)

Effective Period: 7/1/2022 - 3/16/2023
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Per Hour: \$33.33

Effective Period: 3/17/2023 - 6/30/2023
Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Benefit Per Hour: \$34.59

Elevator Service/Modernization Mechanic (Second Year)

Effective Period: 7/1/2022 - 3/16/2023
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Benefit Per Hour: \$33.90

Effective Period: 3/17/2023 - 6/30/2023
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Benefit Per Hour: \$35.18

Elevator Service/Modernization Mechanic (Third Year)

Effective Period: 7/1/2022 - 3/16/2023
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Per Hour: \$35.03

Effective Period: 3/17/2023 - 6/30/2023
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Benefit Per Hour: \$36.37

Elevator Service/Modernization Mechanic (Fourth Year)

Effective Period: 7/1/2022 - 3/16/2023
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Benefit Per Hour: \$36.17

Effective Period: 3/17/2023 - 6/30/2023
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Benefit Per Hour: \$37.55

(Local #1)

ENGINEER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 5)

Engineer - First Year

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$27.47**

Supplemental Benefit Rate per Hour: **\$30.97**

Engineer - Second Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$34.34**

Supplemental Benefit Rate per Hour: **\$30.97**

Engineer - Third Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$37.77**

Supplemental Benefit Rate per Hour: **\$30.97**

Engineer - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$41.21**

Supplemental Benefit Rate per Hour: **\$30.97**

(Local #15)

ENGINEER - OPERATING

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 5)

Operating Engineer - First Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 40% of Operating Engineer - Road & Heavy Construction V's Rate

Supplemental Benefit Per Hour: **\$24.80**

Operating Engineer - Second Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 50% of Operating Engineer - Road & Heavy Construction V's Rate

Supplemental Benefit Per Hour: **\$24.80**

Operating Engineer - Third Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 60% of Operating Engineer - Road & Heavy Construction V's Rate

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Supplemental Benefit Per Hour: \$24.80

(Local #14)

FLOOR COVERER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Floor Coverer (First Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$24.80

Supplemental Benefit Rate per Hour: \$16.83

Floor Coverer (Second Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$27.80

Supplemental Benefit Rate per Hour: \$18.33

Floor Coverer (Third Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$32.05

Supplemental Benefit Rate per Hour: \$21.93

Floor Coverer (Fourth Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: \$39.93

Supplemental Benefit Rate per Hour: \$23.93

(Carpenters District Council)

GLAZIER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Glazier (First Year)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Glazier (Second Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Glazier (Third Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Glazier (Fourth Year)

Effective Period: 7/1/2022 - 6/30/2023

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: 7/1/2022 - 7/3/2022

Wage Rate per Hour: **\$20.00**

Supplemental Benefit Rate per Hour: **\$14.25**

Effective Period: 7/4/2022 - 6/30/2023

Wage Rate per Hour: **\$20.00**

Supplemental Benefit Rate per Hour: **\$14.75**

Handler (Second 1000 Hours)

Effective Period: 7/1/2022 - 7/3/2022

Wage Rate per Hour: **\$21.00**

Supplemental Benefit Rate per Hour: **\$14.25**

Effective Period: 7/4/2022 - 6/30/2023

Wage Rate per Hour: **\$21.00**

Supplemental Benefit Rate per Hour: **\$14.75**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Handler (Third 1000 Hours)

Effective Period: 7/1/2022 - 7/3/2022

Wage Rate per Hour: **\$24.00**

Supplemental Benefit Rate per Hour: **\$14.25**

Effective Period: 7/4/2022 - 6/30/2023

Wage Rate per Hour: **\$24.00**

Supplemental Benefit Rate per Hour: **\$14.75**

Handler (Fourth 1000 Hours)

Effective Period: 7/1/2022 - 7/3/2022

Wage Rate per Hour: **\$26.00**

Supplemental Benefit Rate per Hour: **\$14.25**

Effective Period: 7/4/2022 - 6/30/2023

Wage Rate per Hour: **\$26.00**

Supplemental Benefit Rate per Hour: **\$14.75**

(Local #78)

HEAT & FROST INSULATOR

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Heat & Frost Insulator (First Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Heat & Frost Insulator (Second Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Heat & Frost Insulator (Third Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Heat & Frost Insulator (Fourth Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 70% of Journeyperson's rate

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

(Local #12)

HOUSE WRECKER
(TOTAL DEMOLITION)
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

House Wrecker - First Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **\$20.80**
Supplemental Benefit Rate per Hour: **\$10.67**

House Wrecker - Second Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **\$22.75**
Supplemental Benefit Rate per Hour: **\$10.67**

House Wrecker - Third Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **\$24.25**
Supplemental Benefit Rate per Hour: **\$10.67**

House Wrecker - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **\$26.75**
Supplemental Benefit Rate per Hour: **\$10.67**

(Mason Tenders District Council)

IRON WORKER - ORNAMENTAL
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

Iron Worker (Ornamental) - First Year

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$20.63**

Supplemental Benefit Rate per Hour: **\$17.61**

Iron Worker (Ornamental) - Second Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$24.22**

Supplemental Benefit Rate per Hour: **\$18.86**

Iron Worker (Ornamental) - Third Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$27.80**

Supplemental Benefit Rate per Hour: **\$20.12**

Iron Worker (Ornamental) - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$31.38**

Supplemental Benefit Rate per Hour: **\$21.38**

(Local #580)

IRON WORKER - STRUCTURAL

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Iron Worker (Structural) - 1st Six Months

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$28.97**

Supplemental Benefit Rate per Hour: **\$58.62**

Iron Worker (Structural) - 7- 18 Months

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$29.57**

Supplemental Benefit Rate per Hour: **\$58.62**

Iron Worker (Structural) - 19 - 36 months

Effective Period: 7/1/2022 - 6/30/2023

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Wage Rate per Hour: **\$30.18**

Supplemental Benefit Rate per Hour: **\$58.62**

(Local #40 and #361)

**LABORER (FOUNDATION, CONCRETE, EXCAVATING, STREET PIPE
LAYER & COMMON)**

(Ratio Apprentice to Journeyman: 1 to 1, 1 to 3)

**Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) - First
1000 hours**

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 50% of Journeyman's rate

Supplemental Rate Per Hour: \$50.43

**Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) -
Second 1000 hours**

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 60% of Journeyman's rate

Supplemental Rate Per Hour: \$50.43

**Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) -
Third 1000 hours**

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 75% of Journeyman's rate

Supplemental Rate Per Hour: \$50.43

**Laborer (Foundation, Concrete, Excavating, Street Pipe Layer & Common) -
Fourth 1000 hours**

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 90% of Journeyman's rate

Supplemental Rate Per Hour: \$50.43

(Local #731)

MARBLE MECHANICS

(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 4)

Cutters & Setters - First 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 40% of Journeyman's rate

NO BENEFITS PAID DURING THE FIRST TWO MONTHS (PROBATIONARY PERIOD)

Cutters & Setters - Second 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 45% of Journeyman's rate

Cutters & Setters - Third 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 50% of Journeyman's rate

Cutters & Setters - Fourth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 55% of Journeyman's rate

Cutters & Setters - Fifth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 60% of Journeyman's rate

Cutters & Setters - Sixth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 65% of Journeyman's rate

Cutters & Setters - Seventh 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 70% of Journeyman's rate

Cutters & Setters - Eighth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 75% of Journeyman's rate

Cutters & Setters - Ninth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Wage and Supplemental Rate Per Hour: 85% of Journeyperson's rate

Cutters & Setters - Tenth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 95% of Journeyperson's rate

Polishers & Finishers - First 900 Hours

Effective Period: 7/1/2022 - 6/30/2023

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: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 80% of Journeyperson's rate

Polishers & Finishers - Third 900 Hours

Effective Period: 7/1/2022 - 6/30/2023

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$20.95**

Supplemental Benefit Rate per Hour: **\$10.82**

Mason Tender - Second Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$22.90**

Supplemental Benefit Rate per Hour: **\$10.82**

Mason Tender - Third Year

Effective Period: 7/1/2022 - 6/30/2023

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Wage Rate per Hour: **\$24.40**

Supplemental Benefit Rate per Hour: **\$10.82**

Mason Tender - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$26.90**

Supplemental Benefit Rate per Hour: **\$10.82**

(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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$20.70**

Supplemental Benefit Rate per Hour: **\$10.82**

Mason Tender (Interior Demolition) - Second Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$22.65**

Supplemental Benefit Rate per Hour: **\$10.82**

Mason Tender (Interior Demolition) - Third Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$24.15**

Supplemental Benefit Rate per Hour: **\$10.82**

Mason Tender (Interior Demolition) - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$26.65**

Supplemental Benefit Rate per Hour: **\$10.82**

(Local #79)

METALLIC LATHER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Metallic Lather (First Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$22.55**

Supplemental Benefit Rate per Hour: **\$17.87**

Metallic Lather (Second Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$23.60**

Supplemental Benefit Rate per Hour: **\$16.87**

Metallic Lather (Third Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$24.60**

Supplemental Benefit Rate per Hour: **\$15.92**

Metallic Lather (Fourth Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$37.18**

Supplemental Benefit Rate per Hour: **\$21.82**

(Local #46)

MILLWRIGHT

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Millwright (First Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$31.24**

Supplemental Benefit Rate per Hour: **\$35.94**

Millwright (Second Year)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$36.69**

Supplemental Benefit Rate per Hour: **\$39.64**

Millwright (Third Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$42.14**

Supplemental Benefit Rate per Hour: **\$43.99**

Millwright (Fourth Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$53.04**

Supplemental Benefit Rate per Hour: **\$50.75**

(Local #740)

PAINTER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Painter - Brush & Roller - First Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$17.20**

Supplemental Benefit Rate per Hour: **\$17.42**

Painter - Brush & Roller - Second Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$21.50**

Supplemental Benefit Rate per Hour: **\$22.41**

Painter - Brush & Roller - Third Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$25.80**

Supplemental Benefit Rate per Hour: **\$26.46**

Painter - Brush & Roller - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Wage Rate per Hour: **\$34.40**

Supplemental Benefit Rate per Hour: **\$34.15**

(District Council of Painters)

PAINTER - LINE STRIPING (ROADWAY)
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Painter - Line Striping (Roadway) - First Year (Minimum 1000 hours)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$30.36**

Supplemental Benefit Rate per Hour: **\$15.27**

Painter - Line Striping (Roadway) - Second Year (Minimum 1000 hours)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$32.00**

Supplemental Benefit Rate per Hour: **\$15.27**

(Local #1010)

PAINTER - METAL POLISHER
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Metal Polisher (First Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$16.00**

Supplemental Benefit Rate per Hour: **\$7.96**

New Construction - Wage Rate Per Hour: **\$16.39**

Scaffold Over 34 Feet - Wage Rate Per Hour: **\$18.50**

Metal Polisher (Second Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$17.00**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Supplemental Benefit Rate per Hour: **\$7.96**
New Construction - Wage Rate Per Hour: **\$17.44**
Scaffold Over 34 Feet - Wage Rate Per Hour: **\$19.50**

Metal Polisher (Third Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **\$18.00**
Supplemental Benefit Rate per Hour: **\$7.96**
New Construction - Wage Rate Per Hour: **\$18.54**
Scaffold Over 34 Feet - Wage Rate Per Hour: **\$20.50**

(Local 8A-28)

PAINTER - STRUCTURAL STEEL
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Painters - Structural Steel (First Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 40% of Journeyman's rate

Painters - Structural Steel (Second Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 60% of Journeyman's rate

Painters - Structural Steel (Third Year)

Effective Period: 7/1/2022 - 6/30/2023
Wage and Supplemental Rate Per Hour: 80% of Journeyman's rate

(Local #806)

PAVER AND ROADBUILDER
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Paver and Roadbuilder - First Year (Minimum 1000 hours)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$29.86**

Supplemental Benefit Rate per Hour: **\$24.60**

Paver and Roadbuilder - Second Year (Minimum 1000 hours)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$32.00**

Supplemental Benefit Rate per Hour: **\$24.60**

(Local #1010)

PLASTERER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

(Each Term is 800 Hours.)

Plasterer - First Term

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 55% of Journeyperson's rate

Supplemental Rate Per Hour: **\$17.48**

Plasterer - Second Term

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 60% of Journeyperson's rate

Supplemental Rate Per Hour: **\$18.63**

Plasterer - Third Term

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 70% of Journeyperson's rate

Supplemental Rate Per Hour: **\$20.93**

Plasterer - Fourth Term

Effective Period: 7/1/2022 - 6/30/2023

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$21.45**

Supplemental Benefit Rate per Hour: **\$10.32**

Plasterer Tender - Second Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$23.40**

Supplemental Benefit Rate per Hour: **\$10.32**

Plasterer Tender - Third Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$24.90**

Supplemental Benefit Rate per Hour: **\$10.32**

Plasterer Tender - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$27.40**

Supplemental Benefit Rate per Hour: **\$10.32**

(Local #79)

PLUMBER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Plumber - First Year: 1st Six Months

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$16.78**

Supplemental Benefit Rate per Hour: **\$5.43**

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Plumber - First Year: 2nd Six Months

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$19.78**

Supplemental Benefit Rate per Hour: **\$6.43**

Plumber - Second Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$28.99**

Supplemental Benefit Rate per Hour: **\$21.95**

Plumber - Third Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$31.09**

Supplemental Benefit Rate per Hour: **\$21.95**

Plumber - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$33.94**

Supplemental Benefit Rate per Hour: **\$21.95**

Plumber - Fifth Year: 1st Six Months

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$35.34**

Supplemental Benefit Rate per Hour: **\$21.95**

Plumber - Fifth Year: 2nd Six Months

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$47.41**

Supplemental Benefit Rate per Hour: **\$21.95**

(Plumbers Local #1)

**POINTER, WATERPROOFER, CAULKER, SANDBLASTER,
STEAMBLASTER**

(Exterior Building Renovation)

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - First Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$29.86**

Supplemental Benefit Rate per Hour: **\$15.00**

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Second Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$33.74**

Supplemental Benefit Rate per Hour: **\$20.05**

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Third Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$39.02**

Supplemental Benefit Rate per Hour: **\$23.80**

Pointer, Waterproofer, Caulker, Sandblaster, Steamblaster - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$47.05**

Supplemental Benefit Rate per Hour: **\$24.80**

(Bricklayer District Council)

ROOFER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 2)

Roofer - First Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 35% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: **\$3.82**

Roofer - Second Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 50% of Journeyperson's rate

Supplemental Benefit Rate Per Hour: **\$18.92**

Roofer - Third Year

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 60% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$22.64

Roofer - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 75% of Journeyman's rate
Supplemental Benefit Rate Per Hour: \$28.24

(Local #8)

SHEET METAL WORKER
(Ratio of Apprentice to Journeyman: 1 to 1, 1 to 3)

Sheet Metal Worker (0-6 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 25% of Journeyman's rate
Supplemental Rate Per Hour: \$6.84

Sheet Metal Worker (7-18 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 35% of Journeyman's rate
Supplemental Rate Per Hour: \$20.20

Sheet Metal Worker (19-30 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 45% of Journeyman's rate
Supplemental Rate Per Hour: \$27.48

Sheet Metal Worker (31-36 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 55% of Journeyman's rate
Supplemental Rate Per Hour: \$32.52

Sheet Metal Worker (37-42 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 55% of Journeyman's rate
Supplemental Rate Per Hour: \$32.52

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Sheet Metal Worker (43-48 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: \$40.08

Sheet Metal Worker (49-54 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: \$40.08

Sheet Metal Worker (55-60 Months)

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: \$45.12

(Local #28)

SIGN ERECTOR

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

Sign Erector - First Year: 1st Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 35% of Journeyperson's rate
Supplemental Rate Per Hour: \$17.09

Sign Erector - First Year: 2nd Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 40% of Journeyperson's rate
Supplemental Rate Per Hour: \$19.39

Sign Erector - Second Year: 1st Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 45% of Journeyperson's rate
Supplemental Rate Per Hour: \$21.70

Sign Erector - Second Year: 2nd Six Months

Effective Period: 7/1/2022 - 6/30/2023

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Wage Rate Per Hour: 50% of Journeyperson's rate
Supplemental Rate Per Hour: \$24.02

Sign Erector - Third Year: 1st Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 55% of Journeyperson's rate
Supplemental Rate Per Hour: \$32.50

Sign Erector - Third Year: 2nd Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 60% of Journeyperson's rate
Supplemental Rate Per Hour: \$35.35

Sign Erector - Fourth Year: 1st Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 65% of Journeyperson's rate
Supplemental Rate Per Hour: \$39.00

Sign Erector - Fourth Year: 2nd Six Months

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 70% of Journeyperson's rate
Supplemental Rate Per Hour: \$41.95

Sign Erector - Fifth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 75% of Journeyperson's rate
Supplemental Rate Per Hour: \$44.89

Sign Erector - Sixth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate Per Hour: 80% of Journeyperson's rate
Supplemental Rate Per Hour: \$47.80

(Local #137)

STEAMFITTER

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 3)

Steamfitter - First Year

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate and Supplemental Per Hour: 40% of Journeyperson's rate

Steamfitter - Second Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate and Supplemental Rate Per Hour: 50% of Journeyperson's rate.

Steamfitter - Third Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate and Supplemental Rate per Hour: 60% of Journeyperson's rate.

Steamfitter - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate and Supplemental Rate Per Hour: 70% of Journeyperson's rate.

Steamfitter - Fifth Year

Effective Period: 7/1/2022 - 6/30/2023

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: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$21.23**

Supplemental Benefit Rate per Hour: **\$13.29**

Refrigeration & Air Conditioner (Second Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$25.63**

Supplemental Benefit Rate per Hour: **\$14.57**

Refrigeration & Air Conditioner (Third Year)

Effective Period: 7/1/2022 - 6/30/2023

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Wage Rate per Hour: **\$29.85**

Supplemental Benefit Rate per Hour: **\$15.91**

Refrigeration & Air Conditioner (Fourth Year)

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate per Hour: **\$36.05**

Supplemental Benefit Rate per Hour: **\$17.72**

(Local #638-B)

STONE MASON - SETTER

(Ratio Apprentice of Journeyman: 1 to 1, 1 to 2)

Stone Mason - Setters - First 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 50% of Journeyman's rate

Stone Mason - Setters - Second 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 60% of Journeyman's rate

Supplemental Rate Per Hour: 50% of Journeyman's rate

Stone Mason - Setters - Third 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 70% of Journeyman's rate

Supplemental Rate Per Hour: 50% of Journeyman's rate

Stone Mason - Setters - Fourth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 80% of Journeyman's rate

Supplemental Rate Per Hour: 50% of Journeyman's rate

Stone Mason - Setters - Fifth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: 90% of Journeyman's rate

Supplemental Rate Per Hour: 50% of Journeyman's rate

Stone Mason - Setters - Sixth 750 Hours

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Effective Period: 7/1/2022 - 6/30/2023
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: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **\$20.97**
Supplemental Benefit Rate per Hour: **\$14.25**

Drywall Taper - Second Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **\$24.24**
Supplemental Benefit Rate per Hour: **\$21.26**

Drywall Taper - Third Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **\$29.08**
Supplemental Benefit Rate per Hour: **\$23.01**

Drywall Taper - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023
Wage Rate per Hour: **\$38.78**
Supplemental Benefit Rate per Hour: **\$26.51**

(Local #1974)

TILE LAYER - SETTER
(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 4)

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

Tile Layer - Setter - First 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 35% of Journeyperson's rate

Tile Layer - Setter - Second 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 40% of Journeyperson's rate

Tile Layer - Setter - Third 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 50% of Journeyperson's rate

Tile Layer - Setter - Fourth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 55% of Journeyperson's rate

Tile Layer - Setter - Fifth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 60% of Journeyperson's rate

Tile Layer - Setter - Sixth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 65% of Journeyperson's rate

Tile Layer - Setter - Seventh 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 70% of Journeyperson's rate

Tile Layer - Setter - Eighth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 75% of Journeyperson's rate

Tile Layer - Setter - Ninth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 80% of Journeyperson's rate

Tile Layer - Setter - Tenth 750 Hours

Effective Period: 7/1/2022 - 6/30/2023

Wage and Supplemental Rate Per Hour: 90% of Journeyperson's rate

OFFICE OF THE COMPTROLLER, CITY OF NEW YORK
CONSTRUCTION APPRENTICE PREVAILING WAGE SCHEDULE

(Local #7)

TIMBERPERSON

(Ratio of Apprentice to Journeyperson: 1 to 1, 1 to 6)

Timberperson - First Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: \$22.42

Supplemental Rate Per Hour: \$36.22

Timberperson - Second Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: \$27.53

Supplemental Rate Per Hour: \$36.22

Timberperson - Third Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: \$35.18

Supplemental Rate Per Hour: \$36.22

Timberperson - Fourth Year

Effective Period: 7/1/2022 - 6/30/2023

Wage Rate Per Hour: \$42.84

Supplemental Rate Per Hour: \$36.22

(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 1/1/2022 and 7/1/2022 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 10 00	1.10D: Update Mobilization Payment Add 1.13: Payments to M/WBE Subcontractors
01 22 00	New Section Added
01 40 00	1.7: update minimum and special experience qualifications
01 50 00	3.8B.3: Update DDC Field Office Trailer requirements 3.8D.3: Update Equipment for the DDC Field Office requirements
01 73 00	Add 3.25 Correction of the Work
01 77 00	Remove 3.2 Repair of the Work (moved into 017300, 3.25)



**Department of
Design and
Construction**

Issue Date: July 1, 2022

**DDC STANDARD GENERAL CONDITIONS
FOR SINGLE CONTRACT PROJECTS**



**Department of
Design and
Construction**

Issue Date: July 1, 2022

(No Text on This Page)



**DIVISION 01 – DDC STANDARD GENERAL CONDITIONS – SINGLE CONTRACT PROJECTS
TABLE OF CONTENTS**

SECTION NO.	SECTION TITLE
01 10 00	SUMMARY
01 22 00	EXPANDED WORK ALLOWANCE
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
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 91 13	GENERAL COMMISSIONING REQUIREMENTS FOR MEP SYSTEMS
01 91 15	GENERAL COMMISSIONING REQUIREMENTS FOR BUILDING ENCLOSURE



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



**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. 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 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 Resident Engineer.
 3. Where the materials are to be stored at the site, they must be stored at such locations as will be designated by the Resident Engineer and only in such quantities as, in the opinion of the Resident Engineer, will not interfere with the proper performance of the Work by the Contractor or by other Contractors 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 Resident Engineer.
 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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 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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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.

- D. **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 Payment is 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 Amount	Mobilization Amount
\$0 - \$10,000,000	8% of contract amount
\$10,000,001 - \$50,000,000	8% on the first \$10,000,000 plus 4% of contract amount greater than \$10,000,000
Over \$50,000,000	\$2,400,000

The Contractor may requisition for the Mobilization Payment upon satisfactory completion of the following:

1. DDC approval of the Detailed Bid Breakdown per Article 41 of the Contract;
2. Selection and DDC approval of any required field office location(s);
3. Submission of all required insurance certificates and bond;
4. Approval of the Site Safety Plan per the Safety Requirements Section of the Information for Bidders;
5. Approval of the Progress Schedule;
6. Approval of the Schedule Submittal; and,
7. Submission of the Pre-Construction Photographs.

- E. **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 Resident Engineer 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

1.13 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 Local Law 1 / 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 10 00



SECTION 01 22 00

EXPANDED WORK ALLOWANCE

REFER TO THE ADDENDUM FOR THE APPLICABILITY OF SECTION 01 22 00

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 22 00

EXPANDED WORK ALLOWANCE
01 22 00 - 2



**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. Administrative and Supervisory Personnel
 - 5. Project Meetings
 - 6. Requests for Interpretation (RFI's)
 - 7. Correspondence
 - 8. Contractor's Daily Reports
 - 9. Alternate and Substitute Equipment
- 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 Resident Engineer 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 Resident Engineer will preside over these meetings.
1. Agenda: Prior to each meeting, the Resident Engineer 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 Resident Engineer will summarize the discussion in a brief written statement, and the Contractor will then dictate a brief statement for the record.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

2. Coordination: In addition to construction progress meetings called by the Resident Engineer, 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 Resident Engineer. 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 Resident Engineer 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;



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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 Resident Engineer 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:



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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 Resident Engineer.
 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 Resident Engineer 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 Resident Engineer, or more frequently if directed by the Resident Engineer.
 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 Resident Engineer immediately if the Contractor disagrees with response(s).



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

1.8 CORRESPONDENCE:

- A. Copies of all correspondence to DDC must be sent directly to the Resident Engineer 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



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



**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 Resident Engineer and the Design Consultant. 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 Resident Engineer will review the Submittals Schedule submitted by the Contractor. Upon acceptance, the Resident Engineer will date and sign the schedule as approved and transmit it to the Design Consultant, Contractor, and others within DDC as the Resident Engineer 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 Resident Engineer 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;



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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. Partial Completion(s) and occupancies; and,
18. 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 Resident Engineer. 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



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



**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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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.

<u>Term</u>	<u>Definition</u>
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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

<u>Term</u>	<u>Definition</u>
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.



<u>Term</u>	<u>Definition</u>
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:



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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	<u>Responsibility</u> : Identify the party (e.g. Contractor, subcontractor, City, etc.) responsible for the Activity.
PHAS	<u>Phase</u> : Breakdown of Activities in Milestones, pre-construction, procurement, construction and close-out Activities.
LOCN	<u>Location</u> : Breakdown by floor or elevation.
AREA	<u>Area</u> : 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	<u>Trade</u> : 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.

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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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).



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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;
- 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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 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 16.10



**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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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.

<u>Term</u>	<u>Definition</u>
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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

<u>Term</u>	<u>Definition</u>
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.



<u>Term</u>	<u>Definition</u>
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:



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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	<u>Responsibility</u> : Identify the party (e.g. Contractor, subcontractor, City, etc.) responsible for the Activity.
PHAS	<u>Phase</u> : Breakdown of Activities in Milestones, pre-construction, procurement, construction and close-out Activities.
LOCN	<u>Location</u> : Breakdown by floor or elevation.
AREA	<u>Area</u> : 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	<u>Trade</u> : 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.

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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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).



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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.
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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



**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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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.

<u>Term</u>	<u>Definition</u>
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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

<u>Term</u>	<u>Definition</u>
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.



<u>Term</u>	<u>Definition</u>
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.



<u>Term</u>	<u>Definition</u>
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 (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 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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:



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

Activity Code	Meaning
RESP	<u>Responsibility</u> : Identify the party (e.g. Contractor, subcontractor, City, etc.) responsible for the Activity.
PHAS	<u>Phase</u> : Breakdown of Activities in Milestones, pre-construction, procurement, construction and close-out Activities.
LOCN	<u>Location</u> : Breakdown by floor or elevation.
AREA	<u>Area</u> : 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	<u>Trade</u> : 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.

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:



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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:



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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;
- 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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 Resident Engineer. Such Progress Photographs must be included in each monthly progress report or as otherwise directed by the Resident Engineer.
- 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 Resident Engineer 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 Resident Engineer.
 - 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 Resident Engineer to record settlement or cracking of adjacent structures, pavements, and improvements.
- B. Demolition Operations: Take photographs as directed by the Resident Engineer 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 Resident Engineer 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 Resident Engineer 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 Resident Engineer.
- 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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:



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



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 an Engineer licensed in New York State 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



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



**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. 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.
- 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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 insure 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 masonry 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



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



**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, the Contractor 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



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



**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 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



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



**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. Installer/ Applicator/ Erector: Contractor or another entity engaged by Contractor as an employee or Subcontractor, to perform installation, erection, application, assembly and similar operations.
- E. 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.
- F. 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.
- G. 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.
- H. Source Quality-Control Tests: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.
- I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory means the same as testing agency.



- J. 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.
- K. 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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-Warranted 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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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 projects 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:



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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 especially 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 especially 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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 Resident Engineer or DDC Project Manager to provide access and schedule the Work for inspection by the Special Inspector.

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



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



**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:

<p>REFER TO THE ADDENDUM, Article IX, FOR ADDITIONAL DEFINITIONS AND REVISIONS TO THE CONTRACT AND SPECIFICATIONS</p>
--

- 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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
CIBSE	Chartered 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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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
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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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
IENT	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)



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

NECA	National Electrical Contractors Association
NeLMA	Northeastern Lumber Manufacturers' Association
NEMA	National Electrical Manufacturers Association
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)



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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)



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



**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.



<u>Term</u>	<u>Definition</u>
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 recirculation, 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.

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.

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.

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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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:
 - 1) 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.
 - 2) 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).
 - 3) 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:
 - 1) 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.
 - 2) 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 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:
 - 1) 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.
 - 2) Intermediate floor structures of multi-floor buildings will be considered to be roofed subject to the same requirements of the building roof.
 - 3) 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 must be 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 must be responsible for the provision of Temporary Heat for the time specified herein, regardless of any delays in completion of the Project, including delays that



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

result in the commencement of the provision of Temporary Heat during a season that is later than that which may have been originally anticipated. The Contractor must include in its total Contract price all expenses in connection with the provision of Temporary Heat in accordance with the requirements specified herein.

2. The total Contract duration is set forth in Schedule A of the Addendum. The table set forth below indicates the number of full heating seasons that are deemed included in various Contract durations, which are specified in CCDs. At a minimum, a full heating season must extend from October 15th to April 15th.

<u>Contract Duration</u>	<u>Full Heating Seasons Required</u>
up to 360 CCD	1 full heating season
360 to 720 CCD	2 full heating seasons
more than 720 CCD	3 full heating seasons

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 devices 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:



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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.
3. Temporary Heat Allowance for Special Conditions or and/or Unforeseen Circumstances:
 - a. The City may establish an Allowance in the Contract for payment of costs and expenses in connection with the provision of Temporary Heat as set forth herein. If established, the City will include an amount for such Allowance on the Bid Form, and the Contractor must include such Allowance amount in its total Contract price. The Contractor will only be entitled to payment from this Allowance under the conditions and in accordance with the requirements set forth below. In the event this Allowance or any portion thereof remains unexpended at the conclusion of the Contract, such Allowance must remain the sole property of the City. Should the amount of the Allowance be insufficient to provide payment for the expenses specified below, the City will increase the amount of the Allowance.
 - b. The Allowance set forth herein may be utilized only under the conditions set forth below.
 1. In the event 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, and the Commissioner determines that the provision of Temporary Heat is necessary due to special and/or unforeseen circumstances, the Contractor must be responsible for the provision of Temporary Heat, as directed by the Commissioner. The City must pay such Contractor for all costs for labor, material, and equipment necessary and required for the same. Payment must be made in accordance with Article 26 of the Contract, except that the cost of fuel must be as set forth in Paragraph (c) below.
 2. In the event the Commissioner determines that there is a need for maintenance of the permanent heating system by the Contractor after Final Acceptance by the Commissioner of the Work, and that the need for such maintenance is not the fault of the Contractor, the Contractor must provide the required maintenance of the permanent heating system for the period of time directed by the Commissioner. The City will pay the Contractor for the cost of direct labor and fuel necessary and required in connection with such maintenance, excluding the cost of any foremen or other supervision. Payment must be made in accordance with Article 26 of the Contract, except that the cost of fuel must be as set forth in Paragraph (c) below.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- c. Payment for Fuel Costs: Payment from the Allowance set forth herein for the cost of fuel necessary and required to operate the system for the provision of Temporary Heat, or to maintain the permanent heating system under the conditions set forth in Paragraph b above, must be limited to the direct cost of such fuel. The Contractor will not be entitled to any overhead and/or profit for such fuel costs. In order to receive payment for such fuel costs, the Contractor must present original invoices for the same. DDC reserves the right to furnish the required fuel.

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).

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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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. DDC Managed Project Trailer: 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.
 - 3) 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. CM Managed Project Trailer: 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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. 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.
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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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 Contractor 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) Separate telephone lines for the fax machine 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. 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 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 machine and a telephone answering machine 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' warranties. 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 <https://hallways.cap.gsa.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)

- 4) 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 (<i>Minimum</i>)	Upload Speeds (<i>Minimum</i>)
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.

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 Resident Engineer, the fence must be removed.



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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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.

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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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 1/2" 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-SECTION 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 which is a regular working day for a majority of the trade



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

subcontractors. 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.

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:



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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;



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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.



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



**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:

The Contractor must prepare, obtain, and submit the following to the Resident Engineer:

- A. 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;
- B. Site logistics plan / site safety plan;
- C. Installation drawing(s), design, and product data to be provided for **all** scaffold(s) and shed(s) must include, at a minimum:
1. Plan(s);
 2. Elevation(s);
 3. Duty load designation: "standard" (150 psf live load) or "heavy duty" (300 psf live load);
 4. Details including base support, anchors and ties;
 5. Notes and specifications including load limits, number of planked levels, tie spacing, netting, and sequence of installation and removal;
 6. Anchorage into sound material;
 7. Load limits based on pull tests;
 8. Specifications for pull test(s), method, proof load and the number of trials;
 9. Elevations, levels or heights, where anchorage is made into masonry;
 10. Specifications for frames, planks, screw jacks, anchors, and any other ancillary hardware;
 11. Samples for anchors, ties and netting;
 12. Sequence of operations for erection and demolition;
 13. Location plan, heights, widths, "jumps" over doorways and driveways;
 14. Specify size, maximum span and maximum spacing of headers and stringers;
 15. Specify legs, girts, braces, nailing and connections; and,
 16. All sidewalk sheds must be designed, engineered, signed, and sealed by a Professional Engineer licensed in the State of New York;
 - a. Generic (not job-specific) engineering drawings are satisfactory for standard sheds and arrangements.



- b. 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.

PART II – PRODUCTS (Not Used)

PART III – EXECUTION (Not Used)

END OF SECTION 01 54 23



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



**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 Warranty 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.



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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 016000



**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 the applicable 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 the applicable 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 the applicable 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 the applicable 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.



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- F. Submittal Requirements: Approval by the Commissioner of the applicable 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 016000



**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. Payment for Allowances
 25. 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.

<u>Term</u>	<u>Definition</u>
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 1 - PRODUCTS (Not Used)

PART 2 - 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, and conditions, with the subcontractor responsible for installation or application, for compliance with requirements for installation tolerances and other conditions affecting performance. The Contractor must record observations of these examinations:
 - 1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 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 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 Resident Engineer.
- 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 Resident Engineer.

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 Resident Engineer.

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 Resident Engineer. 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 PAYMENT OF ALLOWANCES:

- A. Unless otherwise called for in the Specifications, the following requirements apply to the payment and execution of Allowances established for the Contractor:
 - 1. Allowances are to be utilized when ordered and authorized in writing by the Commissioner.
 - 2. The Contractor will be paid on a time and materials (T&M) basis under the Allowance. Labor will be paid based on the Contractor's Certified Payrolls, all other expenses will be paid on an invoice basis. A markup of twelve percent (12%) for overhead and ten percent (10%) for profit will be allowed, except that no markup will be allowed on Payroll Taxes or on the premium portion of overtime pay or on sales and personal property taxes.



3.25 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 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



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



**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 of construction 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 General Conditions not otherwise defined herein.



<u>Term</u>	<u>Definition</u>
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	<p>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.</p> <p>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.</p> <p>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.</p>
On-site Sorting	<p>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.</p> <p>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.</p>
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, pyrolyzation, 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 in order 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 Protection Agency (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 streams.
 - 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:



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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



Project Name: _____
Project I.D.: _____

Contractor: _____
Prepared by: _____
For Month: _____

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.



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



**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.



<u>Term</u>	<u>Definition</u>
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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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, he/she 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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 COMMISSIONING REQUIREMENTS.
15. Complete final cleaning requirements, including touchup painting.
16. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



**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. All professional seals must be blocked out. 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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.

<u>Term</u>	<u>Definition</u>
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 (1/2) inch high, and contain the following data:



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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:

- B. SCHEDULE B: Requirements for guarantees and warranties for the Project are set forth in Schedule B, which is included as part of the Addendum.
- C. FORM: For all guaranty requirements set forth in Schedule B, the Contractor must provide a written guaranty, in the form set forth herein.
- D. 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



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



**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 COMMISSIONING 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 COMMISSIONING 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.

<u>Term</u>	<u>Definition</u>
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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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:



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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	<p>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).</p> <p>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.</p> <p>Discarded materials from one manufacturing process that are used as constituents in another manufacturing process are pre-consumer recycled materials.</p> <p>"Pre-consumer" may also be referred to as "post-industrial".</p>
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.1 through 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 ($1/2 \times \text{pre-consumer percentage} \times \text{product value} + 1 \times \text{post-consumer percentage} \times \text{product value} = \text{total recycled content value}$).
 - 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 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 \leq 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 his/her 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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

ENVIRONMENTAL BUILDING MATERIALS CERTIFICATION FORM

Contractor Name: _____
Contractor Contact: _____
Telephone Number: _____

Project Name: _____
Project I.D.: _____

Product/Manufacturer	Material Cost ¹	Recycled Content			Regional ⁴			Rapidly Renewable ⁷		VOC content ⁸		Flooring ⁹	Wood	
		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 regarded 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	<p>A pigmented coating. For the purposes of this specification, paint primers are considered to be paints.</p> <p>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).</p> <p>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).</p> <p>C. Non-Flat High-Gloss Coating or Paint: Has a gloss of greater than or equal to 70 (using a 60-degree meter).</p> <p>Anti-Corrosive / Rust Preventative Paint: Coating formulated and recommended for use in preventing the corrosion of ferrous metal substrates.</p>
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	<p>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).</p> <p>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.</p> <p>Discarded materials from one manufacturing process that are used as constituents in another manufacturing process are pre-consumer recycled materials.</p> <p>“Pre-consumer” may also be referred to as “post-industrial”.</p>



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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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 ($\frac{1}{2} \times \text{pre-consumer percentage} \times \text{product value} + 1 \times \text{post-consumer percentage} \times \text{product value} = \text{total recycled content value}$).
 - 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 ($\frac{1}{4}$) of a product
 - ii. Industry-Wide (Generic) EPD: Valued as one half ($\frac{1}{2}$) 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 CO₂e;
 - ii. Depletion of the stratospheric ozone layer, in kg CFC-11;
 - iii. Acidification of land and water sources, in moles H⁺ or kg SO₂;
 - iv. Eutrophication, in kg nitrogen or kg phosphate;
 - v. Formation of tropospheric ozone, in kg NO_x or kg ethene; and depletion of nonrenewable energy resources, in MJ.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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.)



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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 bioaccumulative 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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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,



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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 \leq 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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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 his/her 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/gnrule/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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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.

<u>Term</u>	<u>Definition</u>
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 his/her 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 (%)



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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:

ENVIRONMENTALLY PREFERABLE PURCHASING (EPP) COMPLIANCE



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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.

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 018113.10



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				Comments
	EPP Book Used	Product Type	Product Details	Product Description	Products Per Unit	Cost Per Unit	Units Purchased	Total Cost	
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 regarded 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	<p>A pigmented coating. For the purposes of this specification, paint primers are considered to be paints.</p> <ol style="list-style-type: none">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 their 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 bioaccumulative 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.

VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES,
SEALANTS, PAINTS AND COATINGS FOR LEED v3 BUILDINGS



- 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.

Interior Paints and Primers:

Non-flat: 150 g/l

VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES,
SEALANTS, PAINTS AND COATINGS FOR LEED v3 BUILDINGS



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



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



**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 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”.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

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. OPTION 1 — Flush-Out

- 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. OPTION 2 — Air Testing

- 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:
- 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.
 - 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.
 - 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.
 - 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.
 - 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.
 - 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 Contractor'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.



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

- 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 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. Execution

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.
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. Complete installation checklists as Work is completed and return to CxA through the Commissioner.



Department of Design and Construction

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

9. Provide written responses to the CxA through the Commissioner for resolution of Issues recorded in the Issues Log within five (5) business days.
10. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
11. 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.
12. Submit As-Built documents in accordance with Section 01 78 39 CONTRACT RECORD DOCUMENTS.
13. 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.

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 each 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.
- 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. 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.
- D. 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. Commissioner and Contractor must ensure that all required Commissioning Team members attend.
- E. Testing Coordination: Contractor must coordinate schedule times with the Commissioning Team, through the Commissioner, for tests, inspections, obtaining samples, and similar activities. 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.
- F. Manufacturers' Field Services: The Contractor must coordinate manufacturers' field services, as per the Commissioning Plan.
- G. 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 Contractor, 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 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.
 - 2. Contractor must certify in writing that all relevant instrumentation and control systems have been completed and calibrated; are operating according to the Contract Documents; and that pretest set points have been recorded.
 - 3. 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.
 - 4. 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.
- 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.

3.4 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. Published literature will be specifically oriented to the provided equipment, indicating required operation and maintenance procedures, parts lists, assembly / disassembly diagrams and related information.



3. 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.
 4. 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).

3.5 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 divisions for demonstration and instruction requirements.

3.6 WARRANTY REVIEW / SEASONAL TESTING

- A. 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.
- B. 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 warranty and operational Issues in the Issues database.



3.7 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



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)



**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 his/her 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 Contractor, 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



**Department of
Design and
Construction**

Division 01 – DDC STANDARD GENERAL CONDITIONS
SINGLE CONTRACT PROJECTS
Issue Date: July 1, 2022

(No Text on This Page)

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

30-30 THOMSON AVENUE
TELEPHONE (718) 391-1000

LONG ISLAND CITY, NEW YORK 11101-3045
WEBSITE www.nyc.gov/buildnyc



**Department of
Design and
Construction**

Contract for Furnishing all Labor and Material Necessary

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____



FMS ID: LNCA13HAM



Department of
Design and
Construction

**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/buildnyc

Contract for Furnishing all Labor and Material Necessary and Required for:

CONTRACT NO. 1 GENERAL CONSTRUCTION WORK

Hamilton Fish Park Library Renovation

LOCATION: 415 East Houston Street
BOROUGH: New York, NY 10002
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:

LNCA13HAM

**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/buildnyc

VOLUME 3 OF 3

**ADDENDUM TO THE GENERAL
CONDITIONS**

SPECIFICATIONS

FOR FURNISHING ALL LABOR AND MATERIALS
NECESSARY AND REQUIRED FOR:

**Hamilton Fish Park Library
Renovation**

**LOCATION:
BOROUGH:
CITY OF NEW YORK**

**415 East Houston Street
New York, NY 10002**

CONTRACT NO. 1

GENERAL CONSTRUCTION WORK

New York Public Library

Rice + Lipka Architects

Date: November 3, 2022



ADDENDA CONTROL SHEET

TITLE: Hamilton Fish Park Library Renovation

**GENERAL
COUNSEL**

[illegible]

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

2/6/2023

ADDENDUM No. # 1

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

85023B0027 – LNCA13HAM

Hamilton Fish Park 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 9, 2023, at 2:30 pm is rescheduled to February 24, 2023 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 at (718) 391-1041 or by email at CSB_projectinquiries@ddc.nyc.gov.

Richard Jones, PE CWI
Executive Director, Specifications

DDC PROJECT #: LNCA13HAM

PROJECT NAME: Hamilton Fish Park Library Renovation

ATTACHMENT A - BIDDERS QUESTIONS AND DDC RESPONSES

NOT USED

DDC PROJECT #: LNCA13HAM

PROJECT NAME: Hamilton Fish Park Library Renovation

ATTACHMENT B – REVISIONS TO THE DOCUMENTS

NOT USED

DDC PROJECT #: LNCA13HAM

PROJECT NAME: Hamilton Fish Park Library Renovation

ATTACHMENT C – REVISIONS TO PASSPORT FORMS

This Addendum is included within Round 1 of the procurement.

Please note that numbering of addenda is independent of rounds.

Bid Opening Date Changes:

The Bid Opening scheduled for February 9, 2023 at 2:30pm is rescheduled for February 24, 2023 at 2:30pm.

Questionnaire Changes:

None

Item Grid Changes:

None

ADDENDA CONTROL SHEET

TITLE: Hamilton Fish Park Library Renovation

**GENERAL
COUNSEL**

[illegible]

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

2/17/2023

ADDENDUM No. # 2

FOR FURNISHING ALL LABOR AND MATERIAL NECESSARY AND REQUIRED FOR:

85023B0027 – LNCA13HAM

Hamilton Fish Park 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 at (718) 391-1041 or by email at CSB_projectinquiries@ddc.nyc.gov.

Richard Jones, PE CWI
Executive Director, Specifications

DDC PROJECT #: LNCA13HAM

PROJECT NAME: Hamilton Fish Park Library Renovation (Large GC PQL)

ATTACHMENT A - BIDDERS QUESTIONS AND DDC RESPONSES

No.	Bidders Questions	DDC Responses
1	<p>Per Article 17 (Subcontracts) – 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. Schedule A of the General Conditions establishes this percentage at 50% of the contract price. Due to the specialized nature of the work required on this project along with the inclusion of the Wicks MEP trades we request the 50% percentage be adjusted to not more than 90% subcontracted amount.</p>	<p>This percent has been revised to 60%. Refer to the revised Addendum to the General Conditions, included with this Addendum. Also note that, per Volume 2, this project will use a Project Labor Agreement, and is not subject to Wicks Law.</p>
2	<p>Schedule A of the Addendum to General Conditions states that the minimum Commercial General Liability limits shall be \$3,000,000 per occurrence and \$6,000,000 per project aggregate applicable to this Contract. Please be advised that smaller subcontractors, including M/WBE subcontractors, do not carry such high limits, making difficult to meet the subcontracting and M/WBE goals. We respectfully request that the limits be changed to \$1,000,000 per occurrence and \$2,000,000 per project aggregate to be in line with other projects currently out for bid with the DDC.</p>	<p>These limits have been revised to \$1,000,000 per occurrence and \$2,000,000 per project aggregate. Refer to the revised Addendum to the General Conditions, included with this Addendum.</p>
3	<p>Schedule A in Volume 3 indicates the subcontractor limit to be 50%. The 50% subcontractor limit is not sufficient for the different trades that are required to perform work on this contract. We respectfully request that the subcontractor limits be increased to 75%.</p>	<p>This percent has been revised to 60%. Refer to the revised Addendum to the General Conditions, included with this Addendum.</p>

4	On Drawing L500, detail 03 shows standard landscape edging at the gravel strip at the building. Drawing A003, detail 01 shows Corten steel edging at the same location. Please confirm what type of edging is to be used here. Drawing A002 references this detail for the gravel against the building and at the window well. Should these be different callouts or the same?	Detail 01/A003 is correct. Refer to revised Drawing L500 included with this Addendum. Drawing A002 shows a "separator band" along the building wall, in the planter, and it is detailed on detail 1/A003. Detail 6/A500 shows a ½" aluminum plate as the "planter wall" at the window well. There is no separator band at the window well. Detail 3/L500 shows the "Landscaping" requirements for the planter against the building, and it refers to detail 1/A003 for the separator band.
5	Based on the elevations on the grading plan the ½" aluminum edging at the sidewalk is taller than is shown on detail 02/ A003. Please confirm the required depth of the edging below finished grade.	The edging that is shown on detail 2/A003 is at elevation 13.09' NAV88. This is the elevation for the top of the perimeter planter walls. The edging shown on detail 01/A003 is a separator edging, parallel to the building wall, set off the wall where shown on plan A002. This separator edging is of Corten steel, set 2" below the main planter wall. Total height = 1'-0".
6	There are a few conflicts between the specifications and drawings related to the requirement of Category 6 vs. Category 6A. Can you confirm all cabling on this project is to be Cat 6A?	Cat 6 cable must be used for all data outlets, except WAP. Cat 6A cable must only be used for Wireless Access Points (WAP). See revised specifications 271513 and 271543, included with this Addendum.
7	The Solid Triangle WAP Outlet symbol utilized on Sheet T1.101 is not defined in the Standard Symbols Legend on Sheet T1.000. How many Category 6A cables are required at each WAP outlet location?	Each WAP location must receive 2 CAT6A cables. The solid triangle has been added to TT000 Symbols List. See revised Drawing TT000, included with this Addendum.
8	Will this project be broken into phases, or will the library be closed while construction is going on?	This project will not be broken into phases and the library will be closed during construction.
9	Re: domestic water tie ins, once we are ready to switch over and connect with the existing school, will this be done on regular time or after hours.	Contractor must coordinate the connection of the domestic water tie-ins with the Commissioner, so as not cause a disruption to the school schedule, activities, or events. Contractor is to provide a minimum of one week's notice of the planned work and allow adequate time to perform the work as called for in the Contract Documents.

10	<p>Re: specification section 221116, Article 3.11 Cleaning, the following is noted:</p> <ul style="list-style-type: none"> a. Clean and disinfect potable domestic water piping using and disinfecting procedures prescribed by the Commissioner. b. Submit water samples in samples in sterile bottles to the lab determined by the Commissioner. Repeat procedures if biological examination shows contamination. c. Prepare and submit reports of purging and disinfecting activities. Please clarify which Commissioner we will dealing with: is it the DOB or a special inspector / third party? d. As per the balancing valve, will we need to provide a kit after we balance it and the job is completed? 	<p>Questions a – c: The Commissioner, as noted in Volume 2, Standard Construction Contract, is the head of the Agency that has entered into this Contract, or his/her duly authorized representative.</p> <p>Question d: Yes, the Contractor must provide the kit after the job is completed. See revised specification section 221116, included with this Addendum.</p>
11	<p>We were bidding on this project as masonry subcontractors to one of the plan holders, but they had decided not to pursue this job further. We'd like to reach out to other plan holders with our pricing. Would it be possible to obtain a list of plan holders so that we can reach out to them directly?</p>	<p>The list of Approved Vendors for the DDC Pre-Qualified List, PQL000120 – General Construction Large Projects is available via the NYC PASSPort Procurement and Sourcing Solutions Portal:</p> <p>https://passport.cityofnewyork.us/page.aspx/en/sup/pql_manage_public/120</p> <p>Click on the number of Approved Vendors to open the list.</p>
12	<p>Request for Alternate - Hush Acoustics PET (felt) Ceiling and Wall Panels. Please see our Requests for Alternate from Hush Acoustics for the PET panels in the NYPL Hamilton Fish Park Library Renovation project, as per the following:</p> <ul style="list-style-type: none"> a. Acoustical Ceiling Panels (section 095113) b. Fixed Sound-Absorptive Panels (section 098413) 	<ul style="list-style-type: none"> a. Ceiling Panels (section 095153): Proposed Hush ceiling panels do not meet NRC rating; therefore, product is not acceptable. b. Wall Panels (Section 098413): Proposed Hush wall panels do not meet NRC rating; therefore, product is not acceptable. <p>For clarification of Basis of Design products, see revised specification section 098413, included with this Addendum.</p> <p>For clarification on panel details, see revised Drawing A741, included with this Addendum.</p>
13	<p>Drawing DM001, note 6 states that "it is assumed that existing utility lines will conflict with construction. All existing and new utility locations must be verified with utility companies and field conditions before any work is commenced." This work is impossible to predict until the work is actually performed. Please advise if the Expanded Work Allowance (Section 012200 of the DDC General Conditions) can be used for this work.</p>	<p>Bidders are advised to estimate an accurate cost for this scope of work. Refer to DDC General Conditions Section 012200, Article 1.3(A) for items covered under the Expanded Work Allowance.</p>

14	Drawing DM101 states to "remove & dispose of all existing bookcases, millwork, equipment and furniture. TYP., UNO." However, the Demolition drawings do not identify the scope and quantities of furniture to be removed & disposed. Please advise if the Expanded Work Allowance (Section 012200 of the DDC General Conditions) can be used for this work.	The contractor is to remove and dispose of all existing bookcases, millwork, equipment, and furniture. This includes all perimeter bookcases as seen as dashed outlines shown on DM101. This also includes all other remaining items within the space, the extent of which is available for general viewing during the library's normal operating hours. See nypl.org for hours of operation. The Expanded Work Allowance referenced in the DDC General Conditions is not intended for this type of work.
15	Please identify the existing Fire Alarm vendor to coordinate work scope.	<p><u>Services the Fire Alarm system:</u> Katarina Skarzynski Sterling Systems Corp. 58 Croft Lane Smithtown, NY 11787 Tel.: (347) 790-0000</p> <p><u>Monitors the Fire Alarm system:</u> Mark Willner Core Commercial Sales Johnson Controls Security Domain 47-40 21st Street, 2nd Floor Long Island City, NY 11101 +1 718 289 6660 direct +1 917 592 5265 mobile mark.willner@jci.com</p> <p>www.johnsoncontrols.com</p>
16	Detail 2/A300 indicates that the left end of the West elevation is to be stained brick, while the right end is to be painted brick. The same drawing also indicates that the right side is to be stained. Please confirm if the façade is to be stained or painted. Additionally, please also confirm on detail 1/A-300 that the entire North Façade is to be stained.	The brick of the left side of the west façade is to be stained as indicated on 1/A300. The brick on the right side is to be painted as indicated. The entire north façade is to be stained. The note reading "Exg brick, stained, typ." has been removed. See revised Drawing A300, included with this Addendum.
17	Detail 1/A-301 indicates that the left and right ends of the South façade are to be stained. The same drawing also indicates that the same areas are to be painted. Please confirm if the façade is to be stained or painted. Please also confirm if the East elevation is to be stained or painted, as the notes also seem to contradict one another.	These notes on 1/A301 have been removed. Both the left and the right-side bricks are to be painted, not stained. The east façade of the existing building is to be painted as indicated on detail 2 East Elevation. See revised Drawing A301, included with this Addendum.

18	Specification section 095153 (Direct-Applied Acoustical Ceilings) states that the Noise Reduction Coefficient (NRC) to be achieved by adhering acoustical tile to the concrete ceiling not be less than 0.70. We have been informed from one of the specified manufacturers that an acoustical tile adhered to a concrete ceiling will only reach a .40 NRC. However, an acoustical tile adhered to the ceiling combined with the baffle Specialty Solution at Specification 09 54 00 will result in an NRC over 1.0. Please advise.	The basis-of-design product, Acoustical Solutions Polyphon, and the second manufacturer, Acoustical Solutions Inc., both meet the NRC requirements. The 3rd manufacturer, ezoBord, has been replaced by Rhino Acoustical Panel, which also meets the NRC requirement. See revised specification 095153, included with this Addendum.
19	Drawing A901 identifies furniture layout and furniture schedule. Is it the Contractor's responsibility to procure furniture? If not, does the Contractor have any responsibility in receiving, unpacking, assembling, and laying out furniture?	The included furniture layout is for reference. Only furniture items specifically called out on the drawings and/or specifications, are to be procured and installed by the Contractor. See revised Drawing A901, included with this Addendum.
20	The drawing set does not identify an area that may be used as a staging area by the construction team. Please advise of staging area location.	Staging will be limited to along the entry (north) side of the library. Contractor to coordinate with all regulatory requirements and governing entities. See revised Drawing DM001, included with this Addendum, for further information.
21	Detail 1/A453 shows the view of the new vestibule section from the west. The drawing seems to be missing a view of the new vestibule when looking east. Please provide this detail.	The east elevation is similar to the west and is also shown on interior elevation views 2 and 4, Drawing A601.
22	On the Door Schedule on Drawing A860, doors 1.04 and 1.08 are defined as Type B, with a height of 7'-0" tall. However, at the bottom of the Drawing, Door Type B is identified as a 8'-4 1/2" high door with 3-1" high fixed transom panel. Please clarify.	Doors 1.04 and 1.08 are 8'-4 1/2" high. See revised Drawing A860, included with this Addendum.
23	Refer to Volume 3, Schedule B, Guarantees and Warranties. Please consider lowering the number of years for the following manufacturer required warranties: a. Section 08 44 13 Glazed Aluminum Curtain Walls Finish - Twenty years b. Section 08 90 00 Louvers and Vents - Twenty years c. Section 12 22 00 Curtains and Drapes - Twenty-Five years d. Section 12 24 13 Roller Window Shades - Twenty-Five years	Warranties are industry standard and will remain as noted in the Contract Documents.

24	General Building Department Note 5 on drawing G001 indicates that the building engineer's time shall be charged to the contractor/tenant for all after hours work. Please advise if the Contractor is responsible and if so, the rate and time frame that the hours are chargeable.	The note is not applicable and has been removed. See revised Drawing G001, included with this Addendum.
25	Please clarify if structural Steel Note 10 "Lintels shall be installed over all openings in masonry walls" on drawing S001 applies to existing openings.	No, only new openings. See revised Drawing S001, included with this Addendum.
26	Detail 6/A501 shows steel angles above the new window shade. Please clarify if this is new steel and what size it is.	They are lintels supporting the brick wall above. The sizes are shown on the detail: 4" x 4" x 1/4". See revised Drawing A501, included with this Addendum.
27	Refer to drawing A-850. Please advise where the following four partition types apply: #6, #10, #12, #13.	Partition types 6, 10, 12, 13 do not apply. See revised Drawing A850, included with this Addendum, for clarification.
28	According to the heading "Exposed Concrete Beams and Columns" on Drawing A840, "all exposed concrete is to be painted." On this same page, under the "Columns" heading, existing columns are to be stripped of plaster, paint, and patched – before application of clear matte penetrating sealant. Other detail pages throughout the drawing set (for example: Note 6 Drawing A600) instruct all concrete columns to be sealed; not painted. Please clarify the scope at the exposed concrete beams and columns.	The note under "Columns" (finish type CO/1.0) is correct. Note 6 on A600 is correct. The note on drawing A840 regarding Exposed Concrete Beams and Columns has been removed. See revised Drawing A840, included with this Addendum.
29	Detail 4/ A600 references a Seating Cushion that is not identified elsewhere in the drawing set. Please advise if this falls within the scope of work for this contract and provide detail/section if it does.	Yes. This cushion is shown on details 5, 6, 7, and 8, on Drawing A946.
30	General note 13 on Drawing P001 indicates to 'provide supplementary steel for carrier support.' Please advise if the Expanded Work Allowance (Section 012200 of the DDC General Conditions) can be used for this work.	This note is not applicable and has been removed. See revised Drawing P001, included with this Addendum.

31	Plumbing demolition notes 10 and 11 on Drawing P001 state to 'reroute or remove all existing piping exposed to view where necessary to avoid new equipment, structural or masonry work as required by proposed alterations, and relocate all piping (that is active) from walls or chases that are to be removed.' Please advise if the Expanded Work Allowance (Section 012200 of the DDC General Conditions) can be used for this work.	These notes are not applicable and have been removed. See revised Drawing P001, included with this Addendum.
32	Please advise who is the security contractor indicated on TY-000 General notes.	There is no security subcontractor currently on site, as this is a new system. Noted subcontractor must meet the requirements set forth in the Division 28 Specifications.
33	Please advise who is the audio-visual Contractor and structured cabling, or telecommunications, Contractor indicated in the matrix on TA-000.	There are no audio-visual, structured cabling, or telecommunications subcontractors currently on site, as this is a new system. Noted subcontractors must meet the requirements set forth in the Division 27 Specifications.
34	Who is the BMS service contractor for the building?	Charles Heebrandt Power Cooling 43-43 Vernon Blvd Long Island City, NY 11101 (718)784-1300

DDC PROJECT #: LNCA13HAM

PROJECT NAME: Hamilton Fish Park Library Renovation (Large GC PQL)

ATTACHMENT B – REVISIONS TO THE DOCUMENTS

Revisions to Volume 3:

Addendum to the General Conditions:

1. Addendum to the General Conditions has been replaced with a new version.
 - a. Updated Schedule A, Part 1 – Contract Requirements, Article 17 Contract.
 - b. Updated Schedule A, Part 2 – Types of Insurance, Minimum Limits and Special Conditions.

Specifications Changes:

1. Section 09 51 53 Direct-Applied Ceilings: updated manufacturers.
2. Section 09 84 13 Fixed Sound-Absorptive Panels revised to show correct basis-of-design panel type.
3. Section 22 11 16 Domestic Water Piping: added note re: providing balancing kit.
4. Section 27 15 13 Communications Copper Cabling, with revised language re: Cat 6 and Cat 6A cabling.
5. Section 27 15 43: Communications Faceplates and Connectors, with revised language re: Cat 6 and Cat 6A cabling.

Revisions to the Drawings:

1. Drawing G001: Deleted note # 5 of General Building Department Notes.
2. Drawing L500: Revised detail 3 to coordinate with architectural detail.
3. Drawing DM001: Revised to add note regarding Staging Area.
4. Drawing DM101: Revised to show the existing millwork and furniture.
5. Drawing A003: Clarified detail 1 to show depth of metal separator strip.
6. Drawing A300: Deleted “stain” callout on existing brick wall
7. Drawing A301: Deleted callouts of staining of the brick on existing walls; added note to show extent of painting of existing wall.
8. Drawing A501: Added note and arrows pointing to steel lintel angles
9. Drawing A741: Revised detail of acoustic panels
10. Drawing A840: Deleted notes regarding existing concrete columns and beams.
11. Drawing A850: Crossed-out partition types 6, 10, 12 and 13.
12. Drawing A860: Changed height of doors 1.04 and 1.08 from 7’-0” to 8’-4 1/2”.
13. Drawing A901: Added note regarding furniture.
14. Drawing S001: Lintel note has been revised.
15. Drawing P001: Deleted note 13 from General Notes; deleted notes 10 and 11 from Plumbing Demolition Notes.
16. Drawing TT-000 revised to add WAP to Symbol List

DDC PROJECT #: LNCA13HAM

PROJECT NAME: Hamilton Fish Park Library Renovation (Large GC PQL)

ATTACHMENT C – REVISIONS TO PASSPORT FORMS

This Addendum initiates Round 2 of the procurement.

Please note that numbering of addenda is independent of rounds.

Questionnaire Changes:

None

Item Grid Changes:

None



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 #: LNCA13HAM

PROJECT NAME: Hamilton Fish Park Library Renovation

PROJECT DESCRIPTION: This Project consists of a complete renovation of the interior of the library, including the replacement of the MEP systems, exterior envelope upgrades such as the replacement of all openings, as well as the replacement of the landscape in front of the library.

PROJECT LOCATION: 415 East Houston Street
BOROUGH: Manhattan
CITY OF NEW YORK
ZIP CODE: 10002
COMMUNITY BOARD #: 3

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

NOT USED

III. COMMISSIONING REQUIREMENTS

This project includes MEP and Building Enclosure Commissioning Requirements.

Other specific Commissioning Requirements can be found in the Project Specification Sections.

IV. PROJECT MANAGEMENT

- ☒ DDC shall publicly bid and enter into all contracts for the Project. DDC shall manage the Project using its own personnel.
- ☐ DDC shall publicly bid and enter into all contracts for the Project. A Construction Management firm (the "CM") hired by DDC shall manage the Project. The Contractor is advised that the CM shall serve as the representative of the Commissioner at the site and shall, 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.

<u>Section</u>	<u>Sub-Section</u>	<u>Sub-Section</u>	<u>Applies</u>	<u>Does not Apply</u>	<u>Applies as Amended</u>
01 1000	1.4 (B)	Scope and Intent / LEED		X	
	1.4(C)	Scope and Intent / Commissioning	X		
01 22 00		Expanded Work 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	
	1.6 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		

<u>Section</u>	<u>Sub-Section</u>	<u>Sub-Section</u>	<u>Applies</u>	<u>Does not Apply</u>	<u>Applies as Amended</u>
01 5000	3.8 (B)	DDC Field Office / DDC Field Office Trailer		X	
	3.8 (B-3a)	DDC Field Office / DDC Managed Field Office Trailer		X	
	3.8 (B-3b)	DDC Field Office / CM Managed Field Office Trailer		X	
	3.8 (D)	DDC Field Office / Additional Equipment for the DDC Field Office	X		
	3.13(A-D)	Work Fence Enclosure	X		
	3.17(B)	Project Rendering	X		
	3.18 (A-C)	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 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 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		

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 shall mean 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 shall be 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 must not be subject to the deletion and/or revision set forth above. Such Special Experience Requirement will remain in full force and effect.
 - (c) 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 shall 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 shall 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 shall 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 shall 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 shall have no effect and the Contractor's obligation to provide the manufacturer's warranty, as set forth in the Specifications and/or the Contract Drawings, shall 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 shall be 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. 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 shall 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 shall 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	<input checked="" type="checkbox"/> Project Safety Representative <input type="checkbox"/> Dedicated, full-time Project Safety Representative
Article 14 Contract	Time of Substantial Completion	Consecutive Calendar Days	720
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 Insurance Broker or Agent 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).

The Contractor must provide proof of insurance in compliance with Contract Article 22 to both the City of New York and the New York Public Library. In the certificates of insurance, the certificate holder must be listed as (a) City of New York, c/o Department of Design and Construction, 30-30 Thomson Avenue, Long Island City, NY 11101, with respect to the City of New York as Additional Insured, and (b) The New York Public Library, 445 Fifth Avenue, New York, NY 10016, with respect to the New York Public Library as Additional Insured, as further specified below.

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
<p>■ Commercial General Liability Art. 22.1.1</p>	<p>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).</p> <p>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.</p> <p>Policy must be primary and non-contributing to any insurance or self-insurance maintained by the City and/or New York Public Library, and must contain a waiver of subrogation with respect to (i) the City of New York, including its officials and employees, and (ii) The New York Public Library (NYPL), Astor, Lenox and Tilden Foundations and their respective Trustees, officers, agents and employees.</p> <p>Additional Insureds:</p> <p>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</p> <p>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).</p>

	<p>3. The New York Public Library, Astor, Lenox and Tilden Foundations and its Trustees, officers and agents and employees are included as additional insured. A waiver of subrogation applies in favor of the certificate holder. Coverage applies on a primary non-Contributory basis.</p>
<ul style="list-style-type: none"> ■ 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 	<p>Workers' Compensation, Employers' Liability, and Disability Benefits Insurance: Statutory per New York State law without regard to jurisdiction.</p> <p>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.</p> <p>Jones Act and U.S. Longshoremen's and Harbor Workers' Compensation Act: Statutory per U.S. law.</p> <p>Workers' Compensation policy must contain a waiver of subrogation with respect to (i) the City of New York, including its officials and employees, and (ii) The New York Public Library (NYPL), Astor, Lenox and Tilden Foundations and their respective Trustees, officers, agents and employees.</p>
<ul style="list-style-type: none"> ■ Builders' Risk Art. 22.1.4 	<p>100 % of total value of Work</p> <p>Contractor the Named Insured; the City both an Additional Insured and one of the loss payees as its interests may appear.</p> <p>If the Work does not involve construction of a new building or gut renovation work, the Contractor may provide an installation floater in lieu of Builders Risk insurance.</p> <p>Note: Builders Risk Insurance may terminate upon Substantial Completion of the Work in its entirety.</p>

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
<div> <div>■ Commercial Auto Liability</div> <div>Art. 22.1.5</div> </div>	<p>\$1,000,000.00 per accident combined single limit</p> <p>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.</p> <p>Policy must be primary and non-contributing to any insurance or self-insurance maintained by the City and/or New York Public Library.</p> <p>Additional Insureds:</p> <ol style="list-style-type: none"> 1. City of New York, including its officials and employees, with coverage at least as broad as ISO Form CA 20 48, and 2. The New York Public Library (NYPL), Astor, Lenox and Tilden Foundations and their respective Trustees, officers, agents and employees, with coverage at least as broad as ISO Form CA 20 48.
<div> <div><input type="checkbox"/> Contractor's Pollution Liability</div> <div>Art. 22.1.6</div> </div>	<p>\$_____ per occurrence</p> <p>\$_____ aggregate</p> <p>Additional Insureds:</p> <ol style="list-style-type: none"> 1. City of New York, including its officials and employees, and 2. The New York Public Library (NYPL), Astor, Lenox and Tilden Foundations and their respective Trustees, officers, agents and employees.

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
<input type="checkbox"/> 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. _____
<input type="checkbox"/> 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. _____
<input type="checkbox"/> 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 <input type="checkbox"/> 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
<p>[OTHER] Art. 22.1.8</p> <p><input type="checkbox"/> Collision Liability/Towers Liability</p>	<p>\$_____ per occurrence</p> <p>\$_____ aggregate</p> <p>Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____</p>
<p>[OTHER] Art. 22.1.8</p> <p><input type="checkbox"/> Railroad Protective Liability _____</p>	<p>\$_____ per occurrence</p> <p>\$_____ aggregate</p> <p>Additional Insureds: 1. City of New York, including its officials and employees, and 2. _____ 3. _____</p>
<p>[OTHER] Art. 22.1.8</p> <p>■ Asbestos Liability _____</p>	<p>Only required of the Contractor or Subcontractor performing any required asbestos removal.</p> <p>\$1,000,000 each occurrence, \$2,000,000 aggregate (Combined Single Limit); only required of the Contractor or Subcontractor performing any required asbestos removal.</p> <p>Additional Insureds: 1. City of New York, including its officials and employees, and 2. The New York Public Library, Astor, Lenox and Tilden Foundations and its Trustees, officers and agents and employees are included as additional insured. A waiver of subrogation applies in favor of the certificate holder. Coverage applies on a primary non-Contributory basis.</p>

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.

<p>[OTHER] Art. 22.1.8</p> <p><input type="checkbox"/> Boiler Insurance_____</p>	<p>\$200,000</p>
<p>[OTHER] Art. 22.1.8</p> <p>■ Professional Liability</p> <p>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.</p>	<p>\$1,000,000 per occurrence</p> <p>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.</p> <p>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.</p>
<p>OTHER] Art. 22.1.8</p> <p><input type="checkbox"/> Umbrella/Excess Liability Insurance</p> <p>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.</p>	<p>\$10,000,000 per Occurrence and \$10,000,000 in Aggregate</p>

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)
County of) ss:

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 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 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 shall be (2) two years.
- Trees and/or Plant Material. For trees and/or plant material furnished and installed, the guarantee period shall be (2) two years. During the guarantee period, the Contractor shall 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 shall obtain a written warranty from the manufacturer. Such warranty shall 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 shall deliver all required warranties to the Commissioner.

(2) **Required Warranties:**

Specification Number	Material or Equipment	Warranty Period
Section 03 01 30.15	Cleaning Cast-in-Place Concrete	One year
Section 06 61 16	Solid Surfacing Fabrications	Ten years
Section 07 13 26	Self-Adhering Membrane Waterproofing	Ten years
Section 07 27 26	Fluid-Applied Membrane Air Barriers	Ten years
Section 07 42 13	Metal Wall Panels	Ten years
Section 07 52 13	Atactic-Polypropylene-Modified Bituminous Membrane Roofing	Twenty years
Section 07 56 00	Fluid-Applied Roofing	Twenty years
Section 07 92 00	Joint Sealants	Ten years
Section 08 14 16	Flush Wood Doors	Five Years

Section 08 41 13	Aluminum-Framed Entrances and Storefronts	Three years
Section 08 41 13	Aluminum-Framed Entrances and Storefronts Finish	Fifteen years
Section 08 41 26	All-Glass Entrances and Storefronts	Two years
Section 08 44 13	Glazed Aluminum Curtain Walls	Ten years
Section 08 44 13	Glazed Aluminum Curtain Walls Finish	Twenty years
Section 08 71 00	Door Hardware - Door Closers	Ten years
Section 08 71 00	Door Hardware - Exit Devices	Three years
Section 08 71 00	Door Hardware - Locksets & Cylinders	Three years
Section 08 71 00	Door Hardware - All other door hardware	Two years
Section 08 80 00	Glazing - Coated Glass Products	Five years
Section 08 80 00	Glazing - Insulating Glass	Ten years
Section 08 80 00	Glazing - Laminated Glass	Five years
Section 08 90 00	Louvers and Vents	Twenty years
Section 09 54 00	Specialty Ceilings	One year
Section 09 64 00	Wood Flooring	Three years
Section 09 68 13	Tile Carpeting	One year
Section 12 22 00	Curtains and Drapes	Twenty-Five years
Section 12 24 13	Roller Window Shades	Twenty-Five years
Section 22 33 00	Electric Domestic Water Heaters	Five years
Section 23 05 00	Common Work Results for HVAC	One year
Section 23 05 13	Common Motor Requirements for HVAC	One year
Section 23 05 29	Hangers and Supports for HVAC Piping and Equipment	One year
Section 23 05 48	Vibration and Seismic Controls for HVAC	One year
Section 23 05 53	Identification for HVA Piping and Equipment	One year
Section 23 05 93	Testing, Adjusting and Balancing	One year
Section 23 07 00	HVAC Insulation	One year
Section 23 09 00	Instrumentation and Control for HVAC	One year
Section 23 23 00	Refrigerant Piping	One year
Section 23 31 13	Metal Ducts	One year
Section 23 33 00	Air Duct Accessories	One year
Section 23 34 16	Centrifugal HVAC Fans	One year
Section 23 37 13	Diffusers, Registers and Grilles	One year
Section 23 62 46	Packaged Variable-Refrigerant- Flow Air Conditioning System	Ten years - compressor(s) and all p

Section 23 72 00	Air-To-Air Energy Recovery Equipment	18 months
Section 23 72 00	Air-To-Air Energy Recovery Equipment Heat exchanger and Urethane belt drive	Six years
Section 23 72 00	Air-To-Air Energy Recovery Equipment Compressor and compressor parts	Three years
Section 23 82 00	Convection Heating and Cooling Units	Two years
Section 26 05 00	Common Work Results for Electrical	One year
Section 26 09 23	Lighting Control Devices	Five years
Section 26 05 19	Low-Voltage Electrical Power Conductors and Cables	One year
Section 26 05 26	Grounding and Bonding for Electrical Systems	One year
Section 26 05 29	Hangers and Supports for Electrical Systems	One year
Section 26 05 33	Raceways and Boxes for Electrical Systems	One year
Section 26 05 33.16	Boxes for Electrical Systems	One year
Section 26 05 53	Identification for Electrical Systems	One year
Section 26 09 23	Lighting Control Devices	Five years
Section 26 24 16	Panelboards	One year
Section 26 27 13	Electricity Metering	One year
Section 26 27 26	Wiring Devices	One year
Section 26 28 13	Fuses	One year
Section 26 28 16.13	Enclosed Circuit Breakers	One year
Section 26 28 16.16	Enclosed Disconnect Switches	One year
Section 26 29 13	Enclosed Controllers	One year
Section 26 33 23	Central Battery Equipment	Two years
Section 26 50 00	Lighting – (all fixtures and equipment except ballasts)	Two years
Section 26 50 00	Lighting - Fluorescent Ballasts	Three years
Section 27 05 33	Conduit and Backboxes for Communications Systems	One year
Section 28 46 00	Fire Detection and Alarm	One year

(3) Application: The obligations under the warranty for the periods specified above shall 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 shall take precedence.
- (b) In the event a warranty requirement set forth in the Specifications is omitted from Schedule B, such omission from Schedule B shall have no effect and the Contractor's obligation to provide the manufacturer's warranty, as set forth in the Specifications, shall 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 shall be 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 shall be 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.

T000.00 Title, Dwg Schedule, Key Plan

General

G001.00 General Notes
G002.00 Symbols, Abbreviations & Mounting Heights
G003.00 Accessibility Diagrams
G004.00 Code Compliance, Occupancy & Life Safety Analysis
G005.00 Firm & Zoning Maps
G006.00 Site Survey Reference Document

Energy

EN001.00 Energy Compliance Sheet - Envelope
EN002.00 Energy Compliance Sheet - Envelope
EN003.00 Energy Compliance Sheet - Envelope
EN100.00 Energy Compliance Sheet - Interior Lighting 1
EN101.00 Energy Compliance Sheet - Interior Lighting 2

Asbestos Abatement

H-001.00 Asbestos Abatement General Notes
H-002.00 Asbestos Abatement First Floor Plan
H-003.00 Asbestos Abatement Mezzanine Floor Plan
H-004.00 Asbestos Abatement Roof Plan
H-005.00 Asbestos Abatement East and West Elevations
H-006.00 Asbestos Abatement South Elevation

Demolition

DM000.00 Site Demolition Plan
DM101.00 1st Floor Demolition Plan
DM101M.00 Mezzanine Demolition Plan
DM102.00 Roof Demolition Plan
DM201.00 1st Floor Demolition RCP
DM300.00 Demolition Exterior Elevations: North & West
DM301.00 Demolition Exterior Elevations: South & East
DM400.00 Demolition Sections South Wall

Civil

C-101.00 Drainage Plan & Civil Details

Landscape

L100.00 Landscape Layout and Materials

L400.00	Irrigation Plan
L410.00	Irrigation Details
L420.00	Planting Plan
L500.00	Landscape Details

Architecture

A000.00	Site Plan
A001.00	Enlarged Site Plan
A002.00	Site Details
A101.00	1st Floor Plan
A102.00	Roof Plan
A141.00	1 st Floor Conduit Routing Plan
A201.00	1st Floor RCP
A300.00	Exterior Elevations: North & West
A301.00	Exterior Elevations: South & East
A400.00	Building Sections
A401.00	Building Sections
A450.00	Exterior Wall Sections
A451.00	Exterior Wall Sections
A452.00	Exterior Wall Sections
A453.00	Exterior Wall Sections: Vestibule
A454.00	Vestibule and Canopy
A500.00	Exterior Details
A501.00	Exterior Details
A502.00	Exterior Details
A503.00	Exterior Details
A504.00	Exterior Details
A505.00	Exterior Details
A600.00	Interior Elevations 1
A601.00	Interior Elevations 2
A602.00	Interior Elevations 3
A603.00	Interior Elevations 4
A720.00	Plumbing Details: Toilet, Janitors Closet & Kitchenettes
A730.00	Interior Wall Sections
A740.00	Interior Details
A741.00	Info Board
A742.00	Door Entry Bollards Details
A801.00	Finish Floor Plan
A840.00	Finishes Key & Details
A850.00	Partition Types
A851.00	Ceiling & Base Details
A860.00	Door Schedule & Types
A861.00	Door Details
A880.00	Window Schedule & Types
A901.00	Coordinated Device, Furniture & Equipment Plan
A940.00	Millwork: Circulation Desk Plans & Sections
A941.00	Millwork: Circulation Desk Elevations & Sections
A942.00	Millwork: Circulation Desk Elevations & Sections

A943.00	Millwork: Tables & Teen Bar
A944.00	Millwork: Center Shelving
A945.00	Millwork: Children Shelving
A946.00	Millwork: Pantry
A947.00	Millwork: Staff Cabinets
A948.00	Millwork: Lectern
A949.00	Millwork: Perimeter Shelving
A950.00	Millwork: Vestibule Shelving
A980.00	Signage & Graphics: Exterior Graphics Plan & Elevation
A981.00	Signage & Graphics: Typ Signage 1
A982.00	Signage & Graphics: Typ Signage 2

Structural

S001.00	Structural General Notes
F0101.00	Foundation Plan
S102.00	1st Floor Framing Plan
S103.00	Entry Canopy Framing Plan
S301.00	Foundation Sections
S401.00	Superstructure Sections
S402.00	Superstructure Sections
S501.00	Typical Details 1
S502.00	Typical Details 2

Mechanical

M001.00	Mechanical Symbols, Abbreviations & General Notes
MD101.00	1st Floor Mechanical Demolition Plan
M101.00	1st Floor Mechanical Plan
M102.00	Roof Mechanical Plan
M201.00	1st Floor Mechanical Piping Plan
M301.00	Mechanical Schedules
M401.00	Mechanical Piping & Air Diagram
M501.00	Mechanical Details
M502.00	Mechanical Details & Control Diagrams
EN001.00	Energy Compliance Sheet
EN002.00	Energy Compliance Sheet

Electrical

E001.00	Electrical Symbol Lists & General Notes
E100.00	Electrical Demolition Floor & Reflected Ceiling Plans
E101.00	1st Floor Electrical Plan
E201.00	1st Floor Lighting Plan
E202.00	Lighting Controls Plan
E203.00	Lighting Controls Diagrams
E204.00	Lighting Controls Diagrams
E205.00	Lighting Controls Diagrams
E301.00	Electrical Riser Diagram, Room Plan, and Details
E302.00	Electrical Details
E401.00	Electrical Schedules
E402.00	Electrical Schedules

Plumbing

P001.00	Plumbing Legend, Notes, Tr-8, Drawing List and Plot Plan
P002.00	Plumbing Schedules

P100.00	1st Floor Plumbing Demolition Plan & Demolition Domestic Water Riser Diagram
P101.00	1st Floor Plumbing Plan
P102.00	1st Floor Plumbing Part Plans
P201.00	Sanitary, Storm and Domestic Water Riser Diagrams
P301.00	Plumbing Details 1 of 2
P302.00	Plumbing Details 2 of 2
P203.00	Backflow Preventer Installation Details

Fire Alarm

FA001.00	Fire Alarm Notes, Details, & Symbols
FA101.00	1st Floor Fire Alarm Plan
FA301.00	Fire Alarm Riser Diagram & Matrix

Telecom

TT000.00	Telecom Cover Sheet
TT101.00	Telecom Overall 1st Floor Plan
TT201.00	Telecom Overall 1st Floor RCP
TT301.00	Telecom Part Plan
TT501.00	Telecom Detail Sheet
TT502.00	Telecom Detail Sheet

Security

TY000.00	Security Cover Sheet
TY101.00	Security Overall 1st Floor Plan
TY201.00	Security Part Plan
TY301.00	Security Network Diagram and Schedules
TY401.00	Security Details

Audiovisual

TA000.00	Audiovisual Cover Sheet
TA101.00	Audiovisual Overall 1st Floor Plan
TA151.00	Audiovisual Enlarged Floor Plans
TA201.00	Audiovisual Overall 1st Floor RCP
TA251.00	Audiovisual Enlarged RCP Plans
TA301.00	Audiovisual Elevation & Section Details
TA501.00	Audiovisual System Block Diagram Community Room
TA601.00	Audiovisual Riser Diagrams
TA701.00	Audiovisual Equipment Details
TA702.00	Audiovisual Equipment Details

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 shall 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 shall have no effect and the Contractor's obligation with respect to the electrical motor control equipment, as set forth in the Specifications, shall remain in full force and effect.

DB Disconnect Circuit Breaker (Switch)	P Pilot Light	BG Break Glass Station
TS Thermal Switch	F Firestat	HOA Hand-Off Auto.
MS Magnetic Starter	T Thermostat	PB Push Button Station
CMS Comb. Mag. Starter	AL Alternator	RO Remote "off"

Equip. Ident.	Location	# of Units	HP or KW/ MFA	Volts and Phase	Control Type: See legend above	Remarks:
ACC-1A	Mech. Room	1	13.8 kW	208 V / 3phase	CMS	NEMA 3R
ACC-1B	Mech. Room	1	15.5 kW	208 V / 3 phase	CMS	NEMA 3R
ACC-2	Mech. Room	1	22.3 kW	208 V / 3phase	CMS	NEMA 3R
AC-1A	Community Room	1	1490 Watts	208 V/ 1 phase	DB	
AC-1B	Community Room	1	1490 Watts	208 V/ 1 phase	DB	
AC-1C	Children Toilet	1	375 Watts	208 V/ 1 phase	DB	
AC-1D	Kitchenette	1	375 Watts	208 V/ 1 phase	DB	
AC-2A	Manager Office	1	80 Watts	208 V/ 1 phase	DB	
AC-2B	Office Storage	1	1490 Watts	208 V/ 1 phase	DB	
AC-2C	Staff Offices	1	229 Watts	208 V/ 1 phase	DB	

AC-2D	Staff Break Room	1	200 Watts	208 V/ 1 phase	DB	
AC-2E	Staff Toilet	1	375 Watts	208 V/ 1 phase	DB	
AC-2F	IT Room	1	84 Watts	208 V/ 1 phase	DB	
HR-1	Mech. Room	1	90 Watts	208V/ 1 phase	DB	NEMA 3R
HR-2	Staff Offices	1	90 Watts	208V/1 phase	DB	
ERV-1	Community Room	1	2280 Watts	208V/1 phase	CMS	
ERV-2	Staff Offices	1	2600 Watts	208V/1 phase	CMS	
EF-1	Activity Room	1	0.5 HP	208V/1 Phase	DB	
WH-1	102B	1	3Kw	208V/1Phase	CMS	
WH-2	105B	1	3Kw	208V/1 Phase	CMS	
WB-1	CELLAR	1	3 HP	208 V/ 3 phase	CMS	
CP-1	102B, 105B	2	1/40 HP	115/1Phase	CMS	

SCHEDULE E

Separation of Trades

NOT USED FOR SINGLE CONTRACTS

THIS PAGE INTENTIONALLY LEFT BLANK



TABLE OF CONTENTS

CONTRACT #1 GENERAL CONSTRUCTION

DIVISION 1 - GENERAL REQUIREMENTS

01 91 19.43 Exterior Enclosure Commissioning

DIVISION 2 - EXISTING CONDITIONS

02 41 19 Selective Demolition
02 80 13 Allowance for Incidental Asbestos Abatement
02 82 13 Asbestos Abatement

DIVISION 3 - CONCRETE

03 01 30.51 Cleaning Cast-in-Place Concrete
03 01 30.61 Resurfacing of Cast-in-Place Concrete
03 30 00 Cast in Place Concrete
03 33 00 Architectural Concrete
03 54 16 Hydraulic Cement Underlayment

DIVISION 4 – MASONRY

04 01 20.91 Unit Masonry Restoration
04 20 00 Unit Masonry
04 72 00 Cast Stone Masonry

DIVISION 5 - METALS

05 12 00 Structural Steel Framing
05 31 00 Steel Decking
05 50 00 Metal Fabrications

DIVISION 6 - WOOD, PLASTICS AND COMPOSITES

06 10 00 Rough Carpentry
06 40 23 Interior Architectural Woodwork
06 61 16 Solid Surfacing Fabrications



DIVISION 7 - THERMAL AND MOISTURE PROTECTION

07 13 26	Self-Adhering Sheet Waterproofing
07 21 00	Thermal Insulation
07 27 26	Fluid-Applied Membrane Air Barriers
07 42 13	Metal Wall Panels
07 52 13	Atactic-Polypropylene-Modified Bituminous Membrane Roofing
07 56 00	Fluid-Applied Roofing
07 62 00	Sheet Metal Flashing
07 71 00	Roof Specialties
07 84 00	Firestopping
07 92 00	Joint Sealants

DIVISION 8 - OPENINGS

08 11 13	Hollow Metal Doors and Frames
08 14 16	Flush Wood Doors
08 31 13	Access Doors and Frames
08 41 13	Aluminum-Framed Entrances and Storefronts
08 41 26	All-Glass Entrances and Storefronts
08 44 13	Glazed Aluminum Curtain Walls
08 71 00	Door Hardware
08 80 00	Glazing
08 90 00	Louvers and Vents

DIVISION 9 - FINISHES

09 21 16	Gypsum Board Assemblies
09 30 13	Ceramic Tiling
09 51 53	Direct-Applied Acoustical Ceilings
09 54 00	Specialty Ceilings
09 64 00	Wood Flooring
09 65 13	Resilient Base and Accessories
09 68 13	Tile Carpeting
09 84 13	Fixed Sound-Absorptive Panels
09 90 00	Painting and Coating

DIVISION 10 - SPECIALTIES

10 14 00	Signage
10 22 19	Demountable Partitions
10 28 13	Toilet Accessories
10 44 13	Fire Protection Cabinets
10 75 00	Flagpoles



DIVISION 11 - EQUIPMENT

11 51 23	Library Stack Systems
11 52 13	Electrically Operated Projection Screens

DIVISION 12 - FURNISHINGS

12 22 00	Curtains and Drapes
12 24 13	Roller Window Shades
12 48 13	Entrance Floor Mats and Frames

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 Piping and Equipment
22 05 53	Identification for Plumbing Piping and Equipment
22 07 00	Plumbing Insulation
22 08 00	Commissioning of Plumbing
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 33 00	Electric Domestic Water Heater
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 Requirements for HVAC Equipment
23 05 29	Hangers and Supports for HVAC Piping and Equipment
23 05 48	Vibration And Seismic 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 Systems
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, Grilles and Registers
23 62 46	Packaged Variable Refrigerant Flow Air Conditioning
23 72 00	Air-to-Air Energy Recovery Equipment
23 82 00	Convection Heating and Cooling Units



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 33.16	Boxes for Electrical Systems
26 05 53	Identification for Electrical Systems
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 Disconnect Switches
26 29 13	Enclosed Controllers
26 33 23	Central Battery Equipment
26 50 00	Lighting

DIVISION 27 – COMMUNICATIONS

27 05 26	Grounding and Bonding for Communications Systems
27 05 28	Pathways for Communications Systems
27 05 29	Hangers and Supports for Communications Systems
27 05 33	Conduit & Backboxes for Communication Systems
27 05 53	Identification for Communications Systems
27 10 00	Structured Cabling
27 11 16	Communications Cabinets, Racks, Frames and Enclosures
27 11 19	Communications Termination Blocks and Patch Panels
27 11 23	Communications Cable Management and Ladder Rack
27 11 26	Communications Rack Mounted Power Protection and Power Strips
27 13 13	Communications Copper Backbone Cabling
27 13 23	Communications Optical Fiber Backbone Cabling
27 13 23.13	Communications Optical Fiber Splicing and Terminations
27 15 13	Communications Copper Horizontal Cabling
27 15 43	Communications Faceplates and Connectors
27 16 19	Communications Patch Cords
27 41 16	Integrated Audio-Visual Systems and Equipment

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

28 00 00	Electronic Safety and Security
28 05 07	Power Sources for Electronic Safety and Security
28 10 00	Access Control
28 14 00	Access Control Hardware Devices
28 16 00	Access Control Interfaces



28 21 00	Surveillance Cameras
28 23 00	Video Management System
28 46 00	Fire Detection and Alarm

DIVISION 31 – EARTHWORK

31 23 00	Excavation and Fill
----------	---------------------

DIVISION 32 - EXTERIOR IMPROVEMENTS

32 05 16	Aggregates for Exterior Improvements
32 13 13	Concrete Paving
32 14 13	Precast Concrete Unit Permeable Paving
32 80 00	Irrigation
32 91 00	Planting Preparation
32 93 00	Plants

END OF TABLE OF CONTENTS



THIS PAGE INTENTIONALLY LEFT BLANK

CONTRACT # 1
GENERAL CONSTRUCTION WORK

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 019119.43**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. This section includes exterior enclosure commissioning procedures, including windows, doors, exterior enclosure, and roofing construction that protects climate-controlled interior spaces from unconditioned spaces and the exterior environment.
- B. Related Sections:
 - 1. DDC General Conditions Section 019113 “General Commissioning Requirements for MEP Systems and Section 019115 “General Commissioning Requirements for Building Enclosure” for general commissioning process requirements.

1.3 DEFINITIONS

- A. Refer to the DDC General Conditions.

1.4 SUBMITTALS

- A. The BECA will review and approve submittals related to the commissioned equipment for conformance to the Contract Documents as it relates to the commissioning process, to the functional performance of the equipment and adequacy for developing test procedures. This review is intended primarily to aid in the development of functional testing procedures and only secondarily to verify compliance with equipment specifications. The CxA will notify the Contractor and Commissioner as requested, of items missing or areas that are not in conformance with Contract Documents and which require resubmission.
- B. The CxA will receive a copy of the final approved submittals.
- C. Refer to DDC General Conditions Section 013300 “Submittal Procedures” and Section 019115 “General Commissioning Requirements for Building Enclosure” for general commissioning submittal requirements.

1.5 FIELD QUALITY CONTROL



- A. General: Coordinate with the BETA and BECA and provide reasonable auxiliary services as requested. Notify BECA 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. Provide access for BECA to inspect building envelope components and transitions from the exterior. Provide access via suspended scaffold or boom lift at each façade at the beginning, middle, and end of project.

1.6 QUALITY ASSURANCE

- A. Quality Assurance and Control: Specific commissioning quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Specified commissioning tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 CONTRACTOR'S RESPONSIBILITIES

- A. Attend construction-phase coordination meetings
- B. Provide schedule of field quality control tests and inspections required by the Contract Documents to BECA.
 - 1. Update schedule, as it pertains to the Building Exterior Enclosure, weekly throughout the construction period.
- C. Participate in final review at acceptance meeting.
- D. Provide information requested by BECA for final commissioning documentation.
- E. Cooperate with the BECA, provide access to work, and provide adequate schedule for the work for commissioning tasks.
- F. Furnish copies of all shop drawings, manufacturer's literature, installation instructions, maintenance information, schedules, warranties or other information as requested.
- G. Provide qualified personnel for assistance to complete the commissioning tests, including seasonal testing and all required air and water leakage testing for elements of the building exterior enclosure.
- H. Submit a copy of the Contractor's project and site-specific Quality Assurance program to be implemented for construction for review by the Commissioner and the BECA, prior to beginning construction and prior to the kick-off meeting of the Building Exterior Enclosure Commissioning process.
- I. Participate and ensure all subcontractors utilized for work on this contract participate in meetings prior to beginning construction with the various members of the design and construction teams, including, but not limited to, the Commissioner and the BECA, suppliers, and manufacturer technical representatives. The subcontractors that must attend this meeting include all subcontractors that will be involved in the construction of the building exterior enclosure, including, but not limited



to, the roofing, wall system (including installers for the façade system, including, but not limited to, the masonry, stone, metal panel, siding, EIFS, etc. and installers for the air barrier system and drainage plane and flashing and water management system), flashing, sealant, fenestration, concrete and steel. This meeting will be to discuss construction sequencing and the coordination of trades and the Contractor's project and site-specific Quality Assurance program to be implemented that will be completed during construction of the building exterior enclosure.

- J. Have a representative present during laboratory structural and air and water leakage performance testing of building exterior enclosure materials or systems, as required in the individual specification sections in Divisions 2 through 9.
- K. Chair Building Exterior Enclosure Quality Assurance Meetings with the appropriate subcontractors in attendance, to review and discuss issues and concerns related to the building exterior enclosure noted by the Commissioner and BECA during the previous week and what action will be taken to address the noted non-conformances. Maintain a summary of non-conformances and current status.
- L. Provide a representative to be present and have a representative present from each trade and/or subcontractor associated with installing the system during random building exterior enclosure air and water leakage performance testing, as indicated within the individual sections within Divisions 2 through 9. Provide a written protocol and a timeline for repair of any deficiencies noted during the performance testing and/or a written report from the third-party agency performing the tests indicating what repairs were required. If a systemic problem is identified during testing, please see the following requirement.
- M. Provide a repair and remediation protocol for any systemic failures identified by the BECA, including a timeline for repair of all affected elements. Repaired elements shall not be covered up without review and documentation by the BECA.
- N. Provide copies of all test and inspection reports for inclusion in the Systems Manual to be submitted as part of the project closeout documentation.
- O. Provide a Systems Manual as part of the project record closeout documentation that includes, but is not limited to, closeout requirements listed in these specifications and more specifically:
 - 1. As-built drawings, including a copy of all details and drawings that were installed as part of any addendums or change order directives. All deviations shall be clearly marked in red pen.
 - 2. Specifications for the project, including all accepted product substitutions and any additional specifications as part of any addendums or change order directives. All accepted product substitutions and all deviations shall be clearly marked in red pen.
 - 3. A copy of all accepted change orders.
 - 4. A copy of all final shop drawings for each product requiring shop drawings, with the Commissioner's mark-ups and comments, showing final as-built conditions.
 - 5. A copy of all warranties, organized by product, and any and all product manufacturer letters indicating the product as appropriate to use for the application intended on the project as well as any installation guidance.
 - 6. A master product list summarizing all products used on the project for construction of the building exterior enclosure, organized by tabs in a binder, including the following information:
 - a. Product name
 - b. Product manufacturer
 - c. Catalog or other applicable number for ordering



- d. Manufacturer's contact information, including the contact information for the technical representatives, including one national contact and one regional technical representative contact
 - e. Product color
 - f. Supplier contact information
 - g. Products installation instructions, including installation instructions supplied with any of the shop drawings that indicated field installed items.
 - h. Manufacturer's product maintenance guide including a checklist for periodic review of the product indicating how often the product should be checked and the process for implementing a repair.
- P. A Systems Manual is to be developed for each major building exterior enclosure systems; including, but not limited to:
- 1. Roof (penetrations, curbs, etc.)
 - 2. Exterior walls (masonry, stone, concrete, precast, metal, insulation, framing, vapor retarder, air barrier, sheathing, etc.)
 - 3. Windows
 - 4. Doors, louvers
 - 5. Sealants and expansion joints
 - 6. Control joints
 - 7. Flashings (end dams, drip edges, flexible flashing and metal flashings)
 - 8. Curtain walls or window walls, storefronts
 - 9. Below-grade construction, waterproofing, drainage
 - 10. Floors, slab-on-grade
 - 11. Other special building exterior enclosure systems, equipment and controls
- Q. Participate in maintenance orientation and inspection and in one maintenance and training session with the building operations and maintenance staff and other participants identified by the Commissioner, with the assistance of the BECA.
- R. Provide labor and facilities:
- 1. To provide access to work to be tested.
 - 2. For BECA's use, for storage of instruments and drawings, records, and preparation of daily reports.

3.2 BECA's RESPONSIBILITIES

- A. Provide Project-specific construction checklists and commissioning process test procedures.
- B. Witness component, systems, assemblies installation and testing.
- C. Compile test data, inspection reports, and certificates and include them in the commissioning process report.
- D. Promptly notify Commissioner and Contractor of irregularities or deficiencies in work that are observed during performance of services.

3.3 COMMISSIONING DOCUMENTATION

- A. Provide the following information to BECA for inclusion in the Commissioning Plan:
 - 1. Submittals, information for systems manuals, and other required documents and reports.
 - 2. Identification of installed exterior enclosure components, assemblies, systems, and equipment, including design changes that occurred during the construction phase.



3. Certificate of completion, certifying that exterior enclosure assemblies, systems, equipment, and associated components are complete and ready for testing.
4. Test and inspection reports and certificates.
5. Corrective action documents.

3.4 VERIFICATION

- A. Certify that building exterior enclosure systems, subsystems, and construction have been completed according to the Contract Documents.
- B. BECA will witness and document field quality-control tests and inspections.
 1. Verify that field quality-control testing of building exterior enclosure has been completed and approved, that discrepancies have been corrected, and corrective work approved.
- C. Prepare a preliminary test report. Deficiencies will be evaluated by the Commissioner and the BECA to determine corrective action. Deficiencies shall be corrected and test repeated. All repairs are to be documented by the BECA.
- D. Annotate checklist or data sheet when a deficiency is observed.
- E. Seasonal Testing:
 1. If the testing plan indicates specific seasonal testing, appropriate initial performance tests shall be completed and documented and additional tests scheduled.
- F. If it is determined that the system is not constructed according to the Contract Documents, the Commissioner will decide whether modifications are required to bring the performance of the system to a level where the failure or deficiency is eliminated and shall be implemented or if the test results will be accepted as submitted. If corrective Work is performed, the Commissioner will decide if tests shall be repeated and a revised report is to be submitted.
- G. Testing Reports:
 1. Reports shall include measured data, data sheets, and a comprehensive summary describing the building exterior enclosure systems at the time of testing.
- H. Systems to be commissioned:
 1. Refer to Divisions 2 through 9 of the Specification Sections for each building exterior enclosure element and system that will be commissioned. The systems and elements to be commissioned include, but are not limited to:
 - a. Air, thermal, vapor and moisture barrier integral to the exterior envelope
 - b. Fenestration systems including curtain walls, windows, storefronts and glazed openings
 - c. Exterior wall cladding systems, inclusive of precast cladding panels and formed metal rain-screen cladding systems, etc. with associated insulation, support systems and air and vapor barriers
 - d. Exterior louvers
 - e. Stone or other cladding materials
 - f. Sealant, expansion and control joints related to the exterior envelope



END OF SECTION 019117



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. Alterations, selective demolition and removals as noted on drawings and as required to accommodate new construction.
 - 2. Removal of debris.
 - 3. Protection of existing building and spaces to remain, and shoring of the structure as required for structural integrity and personal safety.
 - 4. Protection of existing curbs and sidewalks.
 - 5. Temporary coverage passageways.
 - 6. Alterations, selective demolition and removals of exterior façade, where noted.
 - 7. Patching and refinishing of existing surfaces damaged as a result of this work.
 - 8. Protection.

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Schedule of Demolition Operations: Submit demolition procedures and operational sequence for Commissioner's review prior to start of work. Submit a written request to Commissioner well in advance of executing any cutting or alteration which affects:
 - 1. The work of tying in or connecting to operational systems of the building, including electrical, mechanical and security systems.
 - 2. The structural value or integrity of any element of the project or of adjacent structures.
 - 3. The integrity or effectiveness of weather-exposed and moisture-resistant elements or systems.
 - 4. The efficiency, operational life, maintenance, or safety of operational elements or systems.



- C. Notice of Differing Conditions: Submit a written notification if, during the work of demolition and cutting, conditions are discovered which significantly vary from those shown on the drawings. Do not commence work until approval of Commissioner.
- D. Shop Drawings: Submit the following prior to starting work:
 - 1. Submit for Commissioner's approval shop drawings indicating location and typical construction details of temporary dustproof and weatherproof partitions.
 - 2. Submit drawings of temporary structural shoring, bracing, framing or support, for the information of the Commissioner. Such drawings will be reviewed by the Commissioner for the effects of such temporary members on the structural elements to remain. These drawings shall include the reason for such temporary members, the location, the direction and magnitude of design reaction forces on existing structure, and details showing how these reaction forces will be applied to the existing structure.
 - a. Submit shop drawings with the Seal of the P.E. engaged by Contractor; P.E. must be licensed in the State of New York.
 - b. The Commissioner will receive acknowledgment for concepts shown. Such acknowledgments will be of the concept only and not of actual capacities or structural design and will not in any way diminish or limit the Contractor's responsibility for the quality and performance of the work and for protecting existing structures and facilities.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Comply with the requirements of all applicable Federal, State and local safety and health regulations regarding the demolition of structures including ANSI/NFPD 241-Building Construction and Demolition Operations.
- C. The Contractor will be responsible for any damage to any adjacent structures or buildings to remain.
- D. Qualifications: Qualifications of Contractor for work of this Section shall not be less than three (3) years of field experience in work of this nature.
- E. Professional Engineering: The Contractor shall retain the services of a Professional Engineer licensed in the State of New York, who shall design and supervise installation of all underpinning and shoring.

1.5 SPECIAL PRECAUTION

- A. Hazardous materials may be encountered during demolition operations including asbestos; comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution. See Sections 028013 and 028213.

1.6 JOB CONDITIONS

- A. Areas of building to be demolished or altered will be vacated and discontinued in use prior to the start of the work.
- B. Partial Removal



1. Items of savable value to the Contractor may be removed from the structure as the work progresses. Salvaged items must be transported from the site as they are removed.
2. Storage or sale of removed items on the site will not be permitted.
- C. Explosives: The use of explosives will not be permitted.
- D. Traffic: Do not close or obstruct streets, walks or other occupied or used facilities without permission from the Commissioner. Provide alternate routes around closed or obstructed traffic ways if required by the New York City Department of Transportation.
- E. Utilities
 1. Maintain any existing utilities required to remain; keep in service and protect against damage during demolition operations.
 2. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by the Commissioner. Provide temporary services during interruptions to existing utilities, as acceptable to ConEdison and the Commissioner.
 3. Disconnect and seal abandoned utilities before starting demolition operations. Coordinate all work with Con Edison.

1.7 SCHEDULING

- A. Before commencing any alteration or demolition work submit, for review and approval by the Commissioner, a schedule showing the commencement, the order, and the completion dates for the various parts of this work.
- B. Before starting any work relating to existing utilities (electrical, sewer, water, heat, gas, fire lines, etc.) that will temporarily discontinue or disrupt service to the structures to remain, notify the Commissioner 7 days in advance and obtain the Commissioner's approval in writing before proceeding with this phase of the work.

PART 2 PRODUCTS

Refer to Part 3 - Execution, for Product Requirements

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 PROTECTION

- A. Execute demolition work to ensure protection of existing portions of building to remain against damages which might occur from falling debris or other cause. Do not interfere with use of adjacent occupied buildings and areas. Maintain free, safe passage to and from occupied adjacent buildings.



- B. Materials Placement: Do not load structure with weight that will endanger, overload or cause excessive deflection of the existing structure, or that will damage finished surfaces adjacent to and/or supported by the existing structure, except portions being removed.
- C. Construction Operations: Do not employ any construction operation, equipment or vehicles that will endanger, overload or cause excessive deflection of the existing structure, or that will damage finished surfaces adjacent to and/or supported by the existing structure, except portions being removed.
- D. Take precautions to guard against movement, settlement, damage, or collapse of any part of building, sidewalks, adjacent property or street passages; be liable for any such movement, settlement or collapse. If such damage does accidentally occur, Contractor shall restore promptly at no cost to City of New York.
- E. Provide the necessary safeguards to prevent accidents, to avoid all necessary hazards and protect the public, the work and property at all times, including Saturdays, Sundays, and holidays.
- F. Be responsible for any and all damages which may arise or occur to any party whatsoever by reason of the neglect in providing proper lights, guards, barriers, or any other safeguards to prevent damage to property, life and limb.
- G. Make such explorations and probes as are necessary to ascertain any required protective measures before proceeding with demolition and removal. Give particular attention to shoring and bracing requirements so as to prevent any damage to existing construction.
 - 1. Provide interior and exterior shoring, bracing, or support to prevent movement or settlement or collapse of structures to be demolished and adjacent facilities to remain. The Contractor's New York State Licensed Professional Engineer shall advise on bracing, shoring, underpinning, or other structural requirements. The Contractor shall bear all responsibility for prevention of movement or other structural fault.
 - 2. The Contractor shall restore the portions of structure or their contents altered by the Contractor in furtherance of his underpinning and support operations. Restoration shall be completed to the conditions which existed prior to the start of the work. Restore any damage caused by inadequate support.
- H. Provide, erect and maintain catch platforms, lights, barriers, weather protection, warning signs, and other items as required for proper protection of the workmen engaged in demolition and alteration operations, occupants of the building, public and adjacent property. Restore any damage caused by the Contractor's operations.
- I. Provide and maintain temporary protection of the existing structure designated to remain where demolition, removal, and new work are being done, connections made, materials handled, or equipment moved.
- J. Take necessary precautions to prevent dust and dirt from rising. Protect unaltered portions of the existing building affected by the operations under this Section by dustproof partitions and other adequate means.
- K. Do not close or obstruct walkways, passageways, or stairways. Do not store or place materials in passageways, stairs, or other means of egress. Conduct operations with minimum traffic interference.
- L. Be responsible for any damage to the existing structure or contents by reason of the insufficiency of protection provided.



- M. Promptly restore damages caused to adjacent facilities by demolition operations.
- N. Provide and maintain weather protection at exterior openings so as to fully protect the interior premises against damage from the elements until such openings are closed by new construction.

3.3 INSPECTION

- A. Verify that areas of demolition work are protected and temporary dustproof partitions have been installed.
- B. Verify that construction to be removed is not load bearing or has been properly braced, framed or supported.
- C. Inspect existing conditions of the project, including elements subject to damage or to movement during demolition and cutting.
- D. After uncovering work, inspect the conditions affecting the installation or performance of the work.
 - 1. Report differing or questionable conditions to the Commissioner in writing; do not proceed with the work until the Commissioner has provided further instructions.

3.4 PREPARATION

- A. Provide adequate temporary support as necessary to ensure the structural value or integrity of the affected portion of the work
- B. Provide devices and methods to protect and monitor other portions of the project from damage.
- C. Pollution Controls
 - 1. Use water sprinkling, temporary enclosures, and other suitable methods to limit the amount of dust and dirt rising and scattering in the air to the lowest practical level.
 - a. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.
 - 2. Clean adjacent structures and improvements of dust, dirt and debris caused by demolition operations. Return adjacent areas to condition existing prior to the start of the work.
 - 3. Provide drainage for temporary water use.

3.5 DEMOLITION AND CUTTING

- A. Selectively demolish existing construction in conformance with the drawings and these specifications.
 - 1. Execute cutting and demolition by methods which will prevent damage to other work and will provide proper surface to receive installation of work by others and patching of finish surfaces.
 - 2. Do all cutting or removal so as to leave neat, true, plumb and square edges, at edges to remain. Use carborundum or diamond saw equipment for cutting masonry, concrete and stone work, where edges or surfaces are to remain.
 - 3. Do not cut or remove construction which might weaken or impair the structural integrity or strength of the structural framing or support systems which are to remain.



4. Demolish and remove materials as shown on the drawings without damage to the remaining parts of the structure or mechanical/electrical/utility systems.
5. Remove materials so as to not impose excessive loads in supporting walls, floors or framing and so as not to damage remaining undemolished portions of the structure.
6. Where portions of structures are to be removed, remaining portions shall be protected from damage and prepared to fit new construction. Damage to portions of structures to remain shall be restored.
7. Reinforcing steel in existing structures shall be left in place, cleaned and aligned to provide tie with new work.
8. Proceed with demolition in a systematic manner.
9. Demolish concrete and masonry in small sections.

B. Shoring

1. Design, provide, erect and maintain necessary temporary shoring, bracing, framing, or support where load bearing structural or supporting members are removed or weakened by cuts or openings or are subject to damage from demolition operations, and otherwise as required for safety or to protect finish surfaces from damage.
2. Construction and adequacy of the shoring shall be the entire responsibility of the Contractor. Any damage caused by the inadequacy of the shoring or other support shall be the responsibility of the Contractor to remedy at no additional expense to the City of New York.
3. Shoring and bracing shall remain until new structural framing and/or supports are installed. Coordinate operations fully with other trades.
4. Be ready at any time to promptly provide, add to, or strengthen temporary shoring, bracing, or support for existing work, in case existing construction begins to show signs of structural stress.

3.6 WORKMANSHIP STANDARDS FOR ALTERATION AND REMOVAL WORK

- A. Cut, remove, alter, temporarily remove and replace, or relocate existing work as required for performance of the work. Perform such work required with due care, including shoring and bracing.
- B. Coordinate patching involving the various trades whether or not specifically mentioned in the respective specification Sections.
- C. Materials or items demolished and not designated to become the property of the City of New York or to be reinstalled shall become the property of the Contractor and shall be removed from the site.
- D. Execute the work in a careful and orderly manner, with the least possible disturbance to the public and to the occupants of the adjacent buildings.
- E. In general, demolish masonry in small sections. Where necessary to prevent collapse of any construction, install temporary shores, struts, or bracing.



- F. Where existing equipment and/or fixtures are indicated to be reused, restore such equipment and/or fixtures and refinish to put in perfect working order. Refinish as directed.
- G. Cut out embedded anchorage and attachment items as required to properly provide for patching and restoration of the respective finishes.
- H. Where utilities are removed, relocated or abandoned, cap, valve, plug, or by-pass to make complete and working installation.
- I. Restore existing pipe and duct coverings damaged by work under this Contract to original undamaged condition.
- J. Immediately restore to service and restore any damage caused by Contractor's workmen to existing pipe and conduits, wires, cables, etc., of utility services or of fire protection systems and communications systems which are not scheduled for discontinuance or abandonment.
- K. Upon completion of contract, deliver work complete. Damage that may be caused by Contractor or Contractor's workmen to existing structures designated to remain, grounds, and utilities shall be restored by Contractor and left in as good condition as existed prior to damaging.
- L. Restore finish work of floors, walls, and ceilings remaining in place but damaged or defaced because of demolition or alteration work to condition equal that which existed at beginning of work under this Contract.
- M. Where alteration or removals expose damaged or unfinished surfaces or materials, refinish such surfaces or materials, or remove them and provide new or salvaged materials to make continuous surfaces uniform.
- N. Perform new work and restore and refinish existing work in conformance with applicable requirements of the specifications, except as follows:
 - 1. Materials for use in restoration of existing surfaces, but not otherwise specified, shall conform to the highest standards of the trade involved, and be in accordance with approved industry standards, and shall be as required to match existing surfaces.
 - 2. Workmanship for restoration of existing materials shall, unless otherwise specified, be equal to similar workmanship existing in or adjacent to the space where the work is being done.
 - 3. Installation of salvaged items where no similar items exist shall be done in accordance with the highest standards of the trade involved and in accordance with approved shop drawings.
- O. Materials or items designated to become the property of the City of New York shall be as shown on the drawings. Remove such items with care and store them in a location at the site to be designated by the Commissioner.
- P. Materials or items designated to be reinstalled shall be as shown on the drawings. Remove such items with care under the supervision of the trade responsible for reinstallation; protect and store until required. Replace materials or items damaged in their removal with similar new material.
- Q. The existing building shall not be used as a work shop. Neither shall the furnishings or equipment in any room be used as work benches. Should any damage occur during the progress of the work to any furniture, fixtures, equipment, or appurtenances therein, such damage shall be restored, replaced or made good by the Contractor.



- R. Where removing existing floor finish and base, remove all adhesive and leave floors and walls smooth and flush, ready to receive new finish.
- S. Finish new and adjacent existing surfaces as specified for new work. Clean existing surfaces of dirt, grease and loose paint before refinishing.

END OF SECTION 02 41 19



**SECTION 028013 – 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 (cummingtonite-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 than 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"	14"	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



**SECTION 028213
NOVEMBER 2017 VERSION**

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 Hamilton Fish Park Branch Library, located at 415 East Houston Street, New York, NY 10002.
- 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. A set of 100% Construction Documents drawings labeled “Hamilton Fish Park Branch Library, Renovation”, dated 03/04/2021, prepared by Rice + Lipka Architects;
 - 2. Asbestos Survey Report performed by Louis Berger titled “Hamilton Fish Park Branch Library, Renovation”, dated 04/13/2021.
- 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 and Assumed ACM found within these areas such as Aircell Pipe Insulation (Gray), Aircell Pipe Fitting Insulation (Gray), Lower Texture Ceiling Plaster (White and Brown Coats), High Texture Ceiling Plaster (Only White Coat Present), Interior Glass Block/Window Frame Caulking (Gray), Exterior Door Frame Caulking (Tan), Drain Flashing (Black), Metal Flashing Caulking at Windows (Beige) and Exterior Louver/Window Frame Caulking (Tan).
 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: First Floor Plan**
 - a. Remove and dispose of asbestos-containing Aircell Pipe Insulation (Gray), Aircell Pipe Fitting Insulation (Gray), Lower Texture Ceiling Plaster (White and Brown Coats), High Texture Ceiling Plaster (Only White Coat Present) and Interior Glass Block/Window Frame Caulking (Gray) within **Work Area 1**. Asbestos-containing Aircell Pipe Insulation (Gray), Aircell Pipe Fitting Insulation (Gray), Lower



Texture Ceiling Plaster (White and Brown Coats), High Texture Ceiling Plaster (Only White Coat Present) and Interior Glass Block/Window Frame Caulking (Gray) shall be removed utilizing NYCDEP Title 15, Chapter 1 Full Containment Procedures.

Work Area	Removal Procedure	Approximate Square Feet (Sq. Ft.)	Approximate Linear Feet (Ln. Ft.)
1	NYCDEP Full Containment Procedure	—	1,300 Ln. Ft. of Aircell Pipe Insulation (Gray) and Aircell Pipe Fitting Insulation (Gray)
		9,000 Sq. Ft. of Lower Texture Ceiling Plaster (White and Brown Coats) and High Texture Ceiling Plaster (Only White Coat Present)	—
		23 Sq. Ft. (275 Ln. Ft.) of Interior Glass Block/Window Frame Caulking (Gray)	—

2. Drawing H003.00: Mezzanine Floor Plan

- a. Remove and dispose of asbestos-containing Aircell Pipe Insulation (Gray) and Aircell Pipe Fitting Insulation (Gray) within **Work Area 2**. Asbestos-containing Aircell Pipe Insulation (Gray) and Aircell Pipe Fitting Insulation (Gray) shall be removed utilizing NYCDEP Title 15, Chapter 1, § 1-105 / § 1-106 Tent and Glove-bag Procedures.

Work Area	Removal Procedure	Approximate Square Feet (Sq. Ft.)	Approximate Linear Feet (Ln. Ft.)
2	NYC DEP Section § 1-105 / § 1-106 Tent and Glove-bag Procedures	—	700 Ln. Ft. of Aircell Pipe Insulation (Gray) and Aircell Pipe Fitting Insulation (Gray)



3. Drawing H004.00: Roof Plan

- a. Remove and dispose of asbestos-containing Drain Flashing (Black) and Metal Flashing Caulking at Windows (Beige) within **Work Area 3**. Asbestos-containing Drain Flashing (Black) shall be removed utilizing NYCDEP Title 15, Chapter 1 § 1-107 Foam Procedure for Roof Removal. Asbestos-containing Metal Flashing Caulking at Windows (Beige) shall be removed utilizing NYCDEP Title 15, Chapter 1 § 1-109 Abatement from Vertical Exterior Surfaces. The asbestos abatement contractor shall be responsible for the removal and disposal of all roofing components down to the substrate/deck.

Work Area	Removal Procedure	Approximate Square Feet (Sq. Ft.)	Approximate Linear Feet (Ln. Ft.)
3	NYCDEP Section § 1-107 Foam Procedure for Roof Removal	18 Sq. Ft. of Drain Flashing (Black)	—
	NYC DEP Section § 1-109 Abatement from Vertical Exterior Surfaces	13 Sq. Ft. (150 Ln. Ft.) of Metal Flashing Caulking at Windows (Beige)	—

4. Drawing H005.00: East & West Elevations

- a. Remove and dispose of asbestos-containing Exterior Door Frame Caulking (Tan) and Exterior Louver/Window Frame Caulking (Tan) within **Work Area 4**. Asbestos-containing Exterior Door Frame Caulking (Tan) and Exterior Louver/Window Frame Caulking (Tan) shall be removed utilizing NYCDEP Title 15, Chapter 1 § 1-109 Abatement from Vertical Exterior Surfaces.
- b. Remove and dispose of asbestos-containing Exterior Louver/Window Frame Caulking (Tan) within **Work Area 5**. Asbestos-containing Exterior Louver/Window Frame Caulking (Tan) shall be removed utilizing NYCDEP Title 15, Chapter 1 § 1-109 Abatement from Vertical Exterior Surfaces.



Work Area	Removal Procedure	Approximate Square Feet (Sq. Ft.)		Approximate Linear Feet (Ln. Ft.)
4	NYC DEP Section § 1-109 Abatement from Vertical Exterior Surfaces	2 Openings	3 Sq. Ft. (40 Ln. Ft.) of Exterior Door Frame Caulking (Tan)	—
		2 Openings	7 Sq. Ft. (90 Ln. Ft.) of Exterior Louver/Window Frame Caulking (Tan)	—
5	NYC DEP Section § 1-109 Abatement from Vertical Exterior Surfaces	1 Opening	3 Sq. Ft. (35 Ln. Ft.) of Exterior Louver/Window Frame Caulking (Tan)	—

5. Drawing H006.00: South Elevation

- a. Remove and dispose of asbestos-containing Exterior Door Frame Caulking (Tan) and Exterior Louver/Window Frame Caulking (Tan) within **Work Area 6**. Asbestos-containing Exterior Door Frame Caulking (Tan) and Exterior Louver/Window Frame Caulking (Tan) shall be removed utilizing NYCDEP Title 15, Chapter 1 § 1-109 Abatement from Vertical Exterior Surfaces.

Work Area	Removal Procedure	Approximate Square Feet (Sq. Ft.)		Approximate Linear Feet (Ln. Ft.)
6	NYC DEP Section § 1-109 Abatement from Vertical Exterior Surfaces	1 Opening	2 Sq. Ft. (21 Ln. Ft.) of Exterior Door Frame Caulking (Tan)	—
		1 Opening	5 Sq. Ft. (55 Ln. Ft.) of Exterior Louver/Window Frame Caulking (Tan)	—

- D. The facility is under the jurisdiction of the New York 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 (cummingtonite-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
201 Varick 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 through 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 Factors⁵

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

¹Employers 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.

²The 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.



³This APF category includes filtering facepieces, and half masks with elastomeric facepieces.

⁴The 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.

⁵These 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:

Abatement Activity	Pre-Abatement	During Abatement	Post- Abatement
Equal to or greater than 10,000 square feet or 10,000 linear feet of ACM	PCM	PCM	TEM
Less than 10,000 square feet or 10,000 linear feet of ACM	PCM	PCM	PCM

Note: TEM is acceptable wherever PCM is required.

- G. The number of air samples required per stage of abatement and size of abatement project is listed in the table below:

		Pre-Abatement	During Abatement	Post Abatement
Large Asbestos Projects				
1.	Full Containment	10	5	10
2.	Glovebag inside Tent	5 ^a	5 ^a	5 ^a
3.	Exterior Foam and Vertical Surfaces	-	5 ^c	5 ^d
4.	Interior Foam	10	5 ^c	10 ^d
Small Asbestos Projects				
1.	Full Containment	6	3	6
2.	Glovebag inside Tent	3 ^b	3 ^b	3 ^b
3.	Tent	3 ^b	3 ^b	3 ^b
4.	Exterior Foam and Vertical Surfaces	-	3 ^c	3 ^d
5.	Interior Foam	6	3 ^c	6 ^d



		Pre-Abatement	During Abatement	Post Abatement
	Minor Projects			
1.	Glovebag inside Tent	-	-	1 ^d
2.	Tent	-	-	1 ^d
3.	Exterior Foam and Vertical Surfaces	-	-	1 ^d
4.	Interior Foam	-	-	1 ^d

^aif more than three (3) tents then two (2) samples required per enclosure.

^bif more than three (3) tents then one (1) sample required per enclosure.

^csamples shall be taken within the work area(s).

^darea sampling is required only if:

- visible emissions are detected during the project
- during-abatement area sampling results exceeded 0.01 f/cc or the pre-abatement area sampling result(s) for interior projects where applicable.
- work area to be reoccupied is an interior space at a school, healthcare, or daycare facility.

H. Prior to commencement of abatement activities, the Third Party Air Monitoring Firm will collect a minimum number of area samples inside each homogeneous work area.

1. Samples will be taken during normal occupancy activities and circumstances at the work site.
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 through 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 inches 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 hard wall 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 workplace 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.
- C. Removal of ACM utilizing NYCDEP Title 15, Chapter 1 §1-105 Tent and Glove-bag Procedures utilizing 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 polyethylene sheeting. Filters in HVAC systems shall be removed and treated as asbestos-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 PART 3 - EXECUTION, Sections 3.01 and 3.02 of these Specifications. Decontamination facilities may be remote from the Work Areas.
 - e. Construct rigid framework to support Work Area barriers. Framework shall be constructed using 2-inch by 4-inch wooden or metal studs placed 16 inches on center when existing walls and/or ceiling do not exist.
 - f. Seal floor drains, sumps, shower tubs, and other collection devices with two layers of fire retardant 6-mil plastic and



minimum 3/8" 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. Any opening greater than 32 square feet shall be framed with 2-inch by 4-inch studding placed 16 inches on center.

- g. Install and initiate operation of AFDs to provide a negative pressure and a minimum of four air changes per hour and negative pressure of -0.02" of water column 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 vacuums to produce a negative air pressure inside the enclosure is prohibited.
- h. Maintain emergency and fire exits from the Work Areas 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. 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.
- i. Temporary lighting within the Work Area and decontamination system shall be provided as required to achieve minimum illumination levels.
- j. Hand power tools used to drill, cut into, or otherwise disturb ACM shall be manufacture equipped with HEPA filtered local exhaust ventilation.
- k. 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.
- l. There shall be an airlock at the entrance to the tent, unless there is an attached worker or waste decontamination system.
- m. Plasticize the area after pre-cleaning, using the following procedures. Do not apply polyethylene sheeting to the wall and ceiling surfaces that will be demolished to access ACM.



- (1) Cover floor with one layer of fire retardant 6-mil polyethylene sheeting, turning layer a minimum of 12 inches up wall, and seal layer to wall.
 - (2) Cover walls with one layer of fire retardant 6-mil polyethylene sheeting, overlapping wall layer a minimum of 12 inches, and seal layer to floor layer.
 - (3) Cover ceilings with one layer of fire retardant 6-mil polyethylene sheeting, overlapping wall layer a minimum of 12 inches, and seal layer to wall layer.
 - (4) Repeat procedure for second layer. All joints in polyethylene sheeting shall be glued and taped in such a manner as to prohibit air passage. Joints on plastic layers shall be staggered to reduce the potential for water to penetrate.
 - (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 as described in this Specification.
 - (7) Repeat preparation of areas accessed by demolition activities as described above.
 - (8) 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.
 - (9) Protect non-ACM insulation within the Work Area(s) with two individual layers of fire retardant 6-mil polyethylene sheeting. Sheeting shall remain in-place until satisfactory clearance air monitoring results are achieved.
- n. Installation of glove-bags for removal of thermal system insulation, when required:
- (1) General: Glove-bag operations shall be performed using commercially available glove-bags of at least fire retardant 6- mil, transparent plastic appropriately sized for the



diameter of the material to be removed. The use of “moveable” glove-bag techniques is strictly forbidden. At no time, shall the glove-bag be sized to allow for the removal of more than three linear feet of insulation. Glove-bag procedures may only be used in conjunction with full containment of the work area or the tent procedure.

- (2) Place the necessary tools and materials inside of the tool pouch of the glove-bag before the glove-bag procedure begins.
- (3) Place duct-tape securely around the affected area to form a smooth area to which the glove-bag can be securely fastened.
- (4) Attach glove-bag to the cable, wire or pipe. Seal top of glove-bag by double folding and stapling. Place duct-tape along the seam to form an airtight seal. Seal sides of glove-bag, where cable, wire or pipe passes through, with duct-tape to form an airtight seal.
- (5) If the material adjacent to the work section is damaged, terminates, is jointed or contains an irregularity, wrap the section in two layers of 6-mil fire retardant polyethylene sheeting and seal airtight with duct-tape.
- (6) Smoke test each glove-bag as indicated below. The Third-Party Air Monitor shall be present during all smoke testing.
- (7) The glove-bag shall be placed under negative pressure utilizing a HEPA vacuum, and a smoke tube shall then be aspirated to direct smoke at all seams and seals from outside the glove-bag. Any leaks detected by the smoke test shall be duct taped airtight.
- (8) All necessary tools and materials shall be brought into the work area before the glove-bag procedure begins.
- (9) Glove-bag procedures shall be conducted by workers specifically trained in glove-bag procedures and equipped with appropriate personal protective equipment.
- (10) The insulation diameter worked shall not exceed one half the bag working length above the attached gloves.



- o. Glove-bag procedures shall be conducted by workers specifically trained in glove-bag procedures and equipped with appropriate personal protective equipment.
- p. 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 Thermal Insulation Using Glove-Bag Techniques:
 - a. Mist material with amended water. Allow sufficient time for the amended water to penetrate the material to be removed.
 - b. Remove the insulation using hand tools such as knives or scissors.
 - c. Exercise caution when removing insulation.
 - d. Remove any residual asbestos-containing insulation from the substrate using wet cleaning methods and nylon-bristled hand brushes.
 - (1) Any insulation ends created by this procedure shall be sealed with encapsulant prior to bag removal or thoroughly wetted before bag removal and sealed with wettable cloth end caps and spray glue or any combination of these materials immediately following bag removal.
 - (2) The tool pouch shall be separated from the bag prior to disposal by twisting it and the wall to which it is attached several times, and taping the twist to hold it in place, thus sealing the bag and the pouch which are severed at the midpoint of the twist. Alternatively, the tools can be pulled through with one or both glove inserts, thus turning the gloves inside out. The glove(s) is/are then



twist sealed forming a new pouch, taped and several mid-seal forming two separate bags.

- (3) A HEPA vacuum shall be used for evacuation of the glove-bag in preparation for removal of the bag from the surface for clean-up in the event of a spill, and for post project clean-up.
- (4) With the glove-bag collapsed and the ACM in the bottom of the bag, the bag shall be twisted several times and taped to seal that section during bag removal.
- (5) A 6-mil plastic bag shall be slipped around the glove-bag while it is still attached to the surface. The bag shall be detached from the surface by removing the tape or cutting the top with blunt scissors.
- (6) The asbestos-containing waste, the clean-up materials, and protective clothing shall be wetted sufficiently, double-bagged minimizing air content, sealed separately, and disposed of in conformance with applicable regulations.

3. Following Removal of ACM Utilizing Tent/Glove-bag Procedure:

- a. Clean all visible accumulations of loose ACM. Metal shovels shall not be used within the Work Area.
- b. Accumulations of dust shall be cleaned continuously until completion of clean up.
- c. After removal of all visible accumulations of ACM, the area shall be:
 - (1) Wet cleaned using rags, mops or sponges.
 - (2) Permitted sufficient time to dry, prior to HEPA vacuuming all substrates.
 - (3) Lightly encapsulated to lockdown residual asbestos. A thin coat of an encapsulating agent shall be applied to any surfaces in the Work Area which were not the subject of removal or other remediation activities. In no event shall encapsulant be applied to any surface that was the subject of removal or other remediation activities prior to obtaining satisfactory clearance air monitoring results. Asbestos abatement contractor shall request and pass a visual inspection performed by the consultant before proceeding



to the next step. Documentation of passing this inspection shall be recorded in a daily logbook.

- (4) The Third-Party Air Monitor will conduct a visual observation of the Work Area to verify the absence of asbestos-containing waste materials.
- (5) If the Work is accepted by the Third-Party Air Monitor based on the inspection, asbestos abatement contractor shall be notified. Conduct the following activities in accordance with the contract and all applicable laws, codes, rules and regulations.
 - (a) All waste shall be removed from the Work Area and holding areas.
 - (b) All tools and equipment are to be removed and decontaminated in the decontamination enclosure system.
- (6) If the Work is not approved, the Third-Party Air Monitor will inform Asbestos abatement contractor who will then HEPA- vacuum and/or wet-clean the Work Area. The Third-Party Air Monitor will then perform a subsequent visual observation. This process will continue until the Third-Party Air Monitor accepts the Work Area as clean.
- (7) The Work Area shall be vacated for a minimum of one hour to allow fibers to settle prior to clearance air monitoring, when required.

d. Final Barrier Removal

- (1) Upon receipt of acceptable clearance testing results polyethylene sheeting (inside layers) and Isolation Barriers shall be removed and disposed accordingly as ACM. The tent shall be collapsed inward, enclosing the contaminated clothing. This contaminated material shall be disposed of in another plastic bag. The HEPA vacuum shall be decontaminated and sealed.
- (2) The area surrounding the abatement workplace shall be cleaned of any visible debris utilizing HEPA-vacuum and wet methods.



- e. The Third-Party Air Monitor will conduct a final visual inspection. Approval must be granted prior to break down of decontamination facility and asbestos abatement contractor demobilization. Other Information: Extra time required to clean Work Areas in order to achieve clearance criteria shall not be considered grounds for an extension of time for contract completion.
- D. Removal of ACM Utilizing NYC DEP § 1-106 Tent Containment Procedures shall be as follows:
 - 4. 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 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 PART 3 - EXECUTION, Sections 3.01 and 3.02 of these Specifications. Decontamination facilities may be remote from the Work Areas.
 - e. Construct rigid framework to support Work Area barriers. Framework shall be constructed using 2-inch by 4-inch wooden or metal studs placed 16 inches on center when existing walls and/or ceiling do not exist.
 - f. Seal floor drains, sumps, shower tubs, and other collection devices with two layers of fire retardant 6-mil plastic and minimum 3/8" fire rated plywood, as necessary, and provide a system to collect all water used by the Contractor. Collected water shall be passed through a water filtration system prior to being discharged into the sanitary sewer. Any opening greater than 32 square feet shall be framed with 2-inch by 4-inch studding placed 16 inches on center.



- g. Install and initiate operation of AFDs to provide a negative pressure and a minimum of four air changes per hour and negative pressure of -0.02" of water column 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 vacuums to produce a negative air pressure inside the enclosure is prohibited.
- h. Maintain emergency and fire exits from the Work Areas 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. 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.
- i. Temporary lighting within the Work Area and decontamination system shall be provided as required to achieve minimum illumination levels.
- j. Hand power tools used to drill, cut into, or otherwise disturb ACM shall be manufacture equipped with HEPA filtered local exhaust ventilation.
- k. 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.
- l. There shall be an airlock at the entrance to the tent, unless there is an attached worker or waste decontamination system.
- m. Plasticize the area after pre-cleaning, using the following procedures. Do not apply polyethylene sheeting to the wall and ceiling surfaces that will be demolished to access ACM.
 - (1) Cover floor with one layer of fire retardant 6-mil polyethylene sheeting, turning layer a minimum of 12 inches up wall, and seal layer to wall.
 - (2) Cover walls with one layer of fire retardant 6-mil polyethylene sheeting, overlapping wall layer a minimum of 12 inches, and seal layer to floor layer.



- (3) Cover ceilings with one layer of fire retardant 6-mil polyethylene sheeting, overlapping wall layer a minimum of 12 inches, and seal layer to wall layer.
- (4) Repeat procedure for second layer. All joints in polyethylene sheeting shall be glued and taped in such a manner as to prohibit air passage. Joints on plastic layers shall be staggered to reduce the potential for water to penetrate.
- (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 as described in this Specification.
- (7) Repeat preparation of areas accessed by demolition activities as described above.
- (8) 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.
- (9) Protect non-ACM insulation within the Work Area(s) with two individual layers of fire retardant 6-mil polyethylene sheeting. Sheeting shall remain in-place until satisfactory clearance air monitoring results are achieved.

n. Pre-Removal Inspections

- (1) Prior to removal of any ACM, the 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) 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.

5. Removal of ACM Utilizing Tent Containment Procedure:



- a. Tent procedures shall be limited to the removal of less than 260 linear feet and 160 square feet of ACM and shall not result in disturbance of ACM during tent erection.
 - b. Mist material with amended water and/or foam. Allow sufficient time for the amended water to penetrate the material to be removed.
 - c. Cut bands, wire or other items placed over insulation or ACM.
 - d. Remove the ACM using hand tools such as knives or scrapers.
 - e. Exercise caution when removing ACM.
 - f. Remove any residual asbestos-containing material from the substrate using wet cleaning methods.
 - g. Seal exposed ends of remaining insulation or ACM with a "wetable cloth" and/or encapsulant.
 - h. Place the removed 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.
 - i. Following the completion of removal of ACM, all visible residues shall be removed from the substrate.
6. Following Removal of ACM Utilizing Tent Containment or tent Procedure:
- a. Clean all visible accumulations of loose ACM. Metal shovels shall not be used within the Work Area.
 - b. Accumulations of dust shall be cleaned continuously until completion of clean up.
 - c. After removal of all visible accumulations of ACM, the area shall be:
 - (1) Wet cleaned using rags, mops or sponges.
 - (2) Permitted sufficient time to dry, prior to HEPA vacuuming all substrates.



- (3) Lightly encapsulated to lockdown residual asbestos. A thin coat of an encapsulating agent shall be applied to any surfaces in the Work Area which were not the subject of removal or other remediation activities. In no event shall encapsulant be applied to any surface that was the subject of removal or other remediation activities prior to obtaining satisfactory clearance air monitoring results. Contractor shall request and pass a visual inspection performed by the consultant before proceeding to the next step. Documentation of passing this inspection shall be recorded in a daily logbook.
- (4) The Third-Party Air Monitor will conduct a visual observation of the Work Area to verify the absence of asbestos-containing waste materials.
- (5) If the Work is accepted by the Third-Party Air Monitor based on the inspection, Contractor shall be notified. Conduct the following activities in accordance with the contract and all applicable laws, codes, rules and regulations.
 - (a) All waste shall be removed from the Work Area and holding areas.
 - (b) All tools and equipment are to be removed and decontaminated in the decontamination enclosure system.
- (6) If the Work is not approved, the Third-Party Air Monitor will inform Contractor who will then HEPA-vacuum and/or wet- clean the Work Area. The Third-Party Air Monitor will then perform a subsequent visual observation. This process will continue until the Third-Party Air Monitor accepts the Work Area as clean.
- (7) The Work Area shall be vacated for a minimum of one hour to allow fibers to settle prior to clearance air monitoring, when required.

d. Final Barrier Removal

- (1) Upon receipt of acceptable clearance testing results polyethylene sheeting (inside layers) and Isolation Barriers shall be removed and disposed accordingly as ACM. The tent shall be collapsed inward, enclosing the contaminated



clothing. This contaminated material shall be disposed of in another plastic bag. The HEPA vacuum shall be decontaminated and sealed.

- (2) The area surrounding the abatement workplace shall be cleaned of any visible debris utilizing HEPA-vacuum and wet methods.

- e. The Third-Party Air Monitor will conduct final visual. Approval must be granted prior to break down of decontamination facility and contractor demobilization. Other Information: Extra time required to clean Work Areas in order to achieve clearance criteria shall not be considered grounds for an extension of time for contract completion.

E. Removal of ACM Roofing and Flashing Materials utilizing NYC DEP § 1-107 Foam Procedure for Roof Removal shall be as follows:

1. Preparation procedures:

- a. These procedures apply only to the removal of asbestos-containing roofing material (ACRM) from exterior roof surfaces. The work area on the roof shall be cordoned off with clearly visible barriers such as caution tape, and only authorized persons shall have access.
- b. The foam or viscous liquid shall be non-toxic, shall not require special respiratory protection for handling, and shall not affect the handling and disposal of the waste.
- c. The foam or viscous liquid shall coat and maintain a stable blanket (minimum 1" thickness) for the duration of the removal process and shall leave an identifiable colored residue when it dissipates.
- d. The foam or viscous liquid shall wet the ACRM. The ACRM shall be kept wet through the bagging process.
- e. Persons entering the work area shall wear correctly-fitting, good traction rubber boots.
- f. Abatement shall not be carried out during adverse weather conditions (e.g., precipitation, high winds, ambient temperature below 32 degrees Fahrenheit, etc.).
- g. The worker decontamination unit may be attached to each work area at an entry/exit from each work area, or may be remote, in which case it shall be equipped with an airlock at the entrance. In addition to the



shower head(s), the shower room shall be equipped with a flexible hose for waste decontamination for removal of less than 1,000 square feet of ACRM. For 1,000 square feet or more of ACRM removal, a separate waste decontamination facility shall be located at an entry/exit from each work area. Remote holding areas for the asbestos containing waste shall comply with Title 16, Chapter 8, Rules of the City of New York (16 RCNY 8 et. seq.).

- h. Movable objects shall be removed from the work area, or kept in place and wrapped in one sheet of fire retardant 6 mil plastic sheeting.
- i. Provisions shall be made to ensure a safe and adequate air supply to affected building(s). All vents, skylights, air intakes, windows and doors opening onto the roof, and all other openings shall be sealed with 2 layers of fire retardant 6 mil plastic or fitting with HEPA filters when appropriate. Temporary extensions may be installed to a height of 10 feet to ensure adequate air exchange instead of sealing vents, air intakes, etc., with 2 layers of plastic or HEPA filters. Drains may be equipped with 5 micron filtering system in lieu of being sealed.
- j. Fixed objects including perimeter walls, bulkheads, cooling towers, ducts and other rooftop appurtenances shall be covered in one sheet of fire retardant 6 mil plastic up to a height of at least six feet.
- k. The asbestos abatement contractor shall be responsible for protection of the interior spaces beneath the roof.
- l. All office equipment and furniture, including but not limited to desks, chairs, computers, printers, cabinets, etc., carpeted and wooden floors shall be covered with one layer of 6- mil plastic sheeting.
- m. The asbestos abatement contractor shall be responsible for any damage that may occur in the interior spaces, including but not limited to office equipment, furniture, floors, etc., beneath the roof during all phases of the roof abatement.
- n. The asbestos abatement contractor shall provide temporary roof protection consisting of 10-mil polyethylene sheeting following abatement over the open roof areas. Strict coordination with the General Asbestos abatement contractor, Construction Project Manager and/or Architect is required and necessary during this phase of abatement.



- o. Preliminary examination shall be conducted and precautions shall be taken to prevent damage to the interior of the building, including but not limited to office equipment, furniture, carpeted and wooden floors, etc., and to ensure no adverse effect on the structural stability of the roof due to the abatement activity.
 - p. Abatement activities shall not be carried out during adverse weather conditions (e.g., precipitation, heavy winds, etc.).
 - q. The floor area between the remote decontamination facility and the Work Area must be protected with 2 layers of 6-mil. polyethylene sheeting suitably anchored.
 - r. Provisions shall be made to ensure a safe and adequate air supply to affected building(s). All vents, skylights, air intakes, windows and doors opening onto the roof, and all other openings are to be sealed with two layers of 6-mil plastic or fitted with HEPA-filters where appropriate. In lieu of sealing vents, air intakes, etc., with two layers of plastic or HEPA-filters, temporary extensions may be installed to a height of 10 feet to ensure adequate air exchange. Drains may be equipped with 5 micron filtering systems in lieu of being sealed.
 - s. 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 Roofing and Flashing Materials:
- a. The asbestos abatement contractor shall be responsible for the removal of all roofing components, including multiple layers of built-up membrane, tar, vapor barrier and/or flashing down to the substrate/deck.



- b. Prior to actual removal, the built-up roofing shall be blanketed and wetted with a minimum 1" coating of the acceptable foam or viscous liquid which shall be maintained for the duration of the removal until the material is bagged. The foam or viscous liquid shall be confined to the work area.
 - c. Hand-held power tools used to drill, cut into, or otherwise disturb the ACRM shall be equipped with the HEPA-filtered local exhaust ventilation and operated to prevent potential fiber release.
 - d. Abatement shall not be performed in adverse weather conditions (e.g., precipitation, heavy winds, etc.). Asbestos abatement contractor shall protect all exposed roof during adverse weather conditions.
 - e. Portable HEPA-vacuum machines shall be available during abatement.
 - f. After the ACM removal and bagging, the bagged waste shall be HEPA-vacuumed, and then wet-cleaned and transferred into the shower room for double bagging. The double-bagged waste shall be transferred outside the clean room for its final transfer for storage in an enclosed waste container.
3. Following Removal of ACM Roofing and/or Flashing:
- a. Upon completion of the abatement in roof work area, clean-up procedures shall involve removal and bagging of:
 - b. The asbestos containing roofing material (ACRM)
 - c. Visible accumulations of asbestos containing waste
 - d. All excess foam or similar viscous liquid
 - e. All debris, and shall be followed by a thorough wet cleaning.
 - f. All tools shall be wet cleaned and HEPA-vacuumed, and then removed from the work area upon completion.
 - g. Following the removal of all debris, the work area shall be thoroughly wet cleaned. The work area shall be allowed to dry completely before the visual inspection is conducted. The inspection shall confirm the absence in the work area of:
 - (1) ACM, debris, bagged ACM waste,



- (2) Excess foam or other viscous liquid.
 - h. If the work area fails visual inspection, it shall undergo another wet cleaning and/or HEPA vacuuming until it passes the visual inspection.
 - i. When the visual inspection and clearance testing is successful, all plastic may be removed.
 - j. Air monitoring shall be conducted in accordance with the relevant provisions of Air sampling shall be conducted in compliance with NYC DEP Title 15 Chapter 1, §1-41 Air Sampling Schedule.
- F. Removal of ACM from Vertical Exterior Surfaces utilizing NYCDEP Title 15, Chapter 1 §1-109 Abatement from Vertical Exterior Surfaces procedures shall be as follows:

Preparation procedures: This procedure shall apply to the abatement of asbestos-containing materials from vertical exterior surfaces such as, but not limited to caulking or glazing compounds, asphaltic materials or tar, cement siding or shingles (including transite), paints, sealants coping stone caps or clay roof tiles.

- a. The entire surface to be abated and ground-level perimeter shall be considered the work area unless partitions and warning tape are used to define the work area.
- b. A restricted area shall be established using warning tape extending at least 25 feet from the affected areas of the building or to the nearest vertical obstruction or the curb.
- c. The restricted area may be entered only by certified workers or authorized visitors.
- d. Before plasticizing, the restricted area shall be inspected for ACM debris and, if necessary, pre-cleaned using HEPA vacuums and wet methods.
- e. All openings to the building or structure's interior which are within 25 feet of the affected ACM shall be closed and sealed.
- f. Scaffolding erected to access the ACM shall be constructed, maintained, and used in accordance with applicable federal, state, and city laws.



- g. Horizontal surfaces beneath the affected ACM shall be covered with two layers of fire-retardant 6-mil plastic to a width of six feet.
- h. Elevated platforms being used to access the affected ACM shall be plasticized with two layers of fire-retardant 6-mil plastic, which shall extend up from the platform to at least the height of the mid-rail on three sides and shall be attached directly to the building just below the surfaces under abatement.
- i. The ground-level restricted area shall be cleared of all moveable objects and plasticized with two sheets of fire-retardant 6-mil plastic, which shall be extended one foot up the side of the building. The plasticized area shall be ten feet wide for every floor up to a maximum width of thirty feet, or to the curb. This plastic shall be cleaned, replaced, and disposed of as asbestos waste at the end of each shift.
- j. Sidewalk bridges in the restricted area shall be covered with two layers of fire retardant 6-mil plastic, placed over and secured to the bridge, spread across the full width, draped over the side to ground level, and extended to a width of at least thirty feet.
- k. Establish a remote decontamination unit in accordance with Section 3.01 within the restricted area.
- l. Construct all elevated work platforms a minimum of one foot below the surface to be abated.
- m. Pre-Removal Inspections
 - (1) Prior to removal of any ACM, the asbestos abatement contractor shall notify the Project 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 Project Monitor's approval of the Work Area preparations, removal of ACM may commence.

2. Removal of ACM Materials:



- a. Mist material with amended water. Allow sufficient time for the amended water to penetrate the material to be removed.
 - b. Remove the caulk using hand tools such as knives or scrapers.
 - c. Exercise caution when removing caulking material to prevent damage to windows or skylight openings.
 - d. Remove any residual asbestos-containing caulking material from the substrate using wet cleaning methods and nylon-bristled hand brushes. The use of metal bristled brushes is prohibited.
 - e. Place the removed material immediately into a properly labeled 6-mil polyethylene bag. All material shall be properly containerized and decontaminated prior to removal from the Work Area.
 - f. Following the completion of removal of caulking, all visible residues shall be removed from the substrate.
 - g. Air sampling shall be conducted in compliance with NYC DEP Title 15 Chapter 1, §1-41 Air Sampling Schedule. This sampling shall be performed by the Third-Party Air Monitoring Firm.
3. Following Removal of ACM:
- a. The stripped substrate shall be HEPA vacuumed and wet-wiped.
 - b. A visual clearance inspection shall be conducted by the asbestos handler supervisor and project monitor after the work area dries, to ensure the absence of ACM residue or debris in the work area.
 - c. After the inspection is completed, the warning tapes and barriers may be removed.
 - d. The clearance inspection shall be documented in the log and the project air sampling log.
 - e. Air monitoring shall be conducted in accordance with relevant provisions.
 - f. Asbestos abatement contractor shall request and pass a visual inspection performed by the consultant before proceeding to the next step. Documentation of passing this inspection shall be recorded in a daily logbook.



- g. The Third-Party Air Monitor will conduct a visual observation of the Work Area to verify the absence of asbestos-containing waste materials.
- h. If the Work is accepted by the Third-Party Air Monitor based on the inspection, asbestos abatement contractor shall be notified. Conduct the following activities in accordance with the contract and all applicable laws, codes, rules and regulations:
 - (1) All waste shall be removed from the Work Area and holding areas.
 - (2) All tools and equipment are to be removed and decontaminated in the decontamination enclosure system.
- i. If the Work is not approved, the Third-Party Air Monitor will inform Asbestos abatement contractor who will then HEPA-vacuum and/or wet-clean the Work Area. The Third-Party Air Monitor will then perform a subsequent visual observation. This process will continue until the Third-Party Air Monitor accepts the Work Area as clean.
- j. Final Barrier Removal
 - (1) Upon receipt of acceptable observation results, polyethylene sheeting and barrier tape shall be removed and disposed accordingly as ACM.
 - (2) The area surrounding the abatement workplace shall be cleaned of any visible debris utilizing HEPA vacuum and wet methods.
 - (3) The Third-Party Air Monitor will conduct final visual inspection. Approval must be granted prior to break down of decontamination facility and asbestos abatement contractor demobilization. Other Information: Extra time required to clean Work Areas in order to achieve clearance criteria shall not be considered grounds for an extension of time for contract completion.



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 028213



SECTION 03 01 30.51 – CLEANING 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
 - 1. Cleaning of existing concrete surfaces.
- B. Related Sections
 - 1. Section 03 30 00 “Cast-in-Place Concrete”
 - 2. Section 03 01 30.61 “Resurfacing of Cast-In-Place Concrete”

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.
- B. Product Data: Submit manufacturer’s complete technical data sheets for the following:
 - 1. Materials.
 - 2. Equipment.
- C. Samples: Submit mock-up samples of cleaned concrete surfaces as directed by the Commissioner.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.
- B. Mock-Ups (coordinate with 03 01 30.61): Provide mock-ups of each type of concrete surface to be patched and cleaned, to demonstrate typical cleaned concrete surface and standard of workmanship.
 - 1. Prior to providing mock-up of cleaned surfaces, submit samples of three different cleaning methods for review. Proceed with mock-up at pressure approved by Commissioner.
 - 2. At an on-site location to be selected by Commissioner, clean a 10 feet by 20 feet area.
 - 3. Obtain approval of mock-up locations from Commissioner prior to commencing cleaning.
 - 4. Notify Commissioner seven (7) days in advance of dates and times when mock-ups will be completed.
 - 5. Complete mockup and sample panels using processes and techniques intended for use on permanent work. Mockup will include samples of control, construction, and expansion joints, and edges in sample



panels and will be produced by the same workers who will perform the cleaning of concrete for the Project, utilizing all approved materials to be employed in the final cleaned surface.

6. The final, approved and accepted field mockup will establish the visual standard for the work of this Section. Final approval will be based on approval of field mockup.
 7. Retain the samples utilized to complete the mockup, as well as the in-situ field mockup, through completion of the cleaning of concrete for use as a quality standard for finished work.
- C. Preinstallation Meetings: Conduct a preinstallation meeting to verify project requirements, and manufacturer's installation instructions. Other items for agenda of preinstallation meetings include, but not be limited to, the following:
1. Environmental requirements.
 2. Scheduling and phasing of work.
 3. Coordinating with other work and personnel.
 4. Protection of adjacent surfaces.
 5. Surface preparation.
 6. Repair of defects and defective work prior to installation.
 7. Cleaning.
 8. Application of liquid sealer.
 9. Protection of finished surfaces after installation.

1.5 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.
- C. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels indicating brand name, directions for storage, directions for mixing with other components and directions for application.
- D. Storage and Protection
 1. Store materials in compliance with manufacturer's written instructions to prevent deterioration from moisture or other detrimental effects.
 2. Dispense materials from factory-numbered and sealed containers. Maintain record of container numbers



1.6 ENVIRONMENTAL LIMITATIONS/ JOB CONDITIONS

- A. Comply with manufacturer's written instructions for substrate temperature and moisture content, ambient temperature and humidity, ventilation, and other conditions affecting cleaning of concrete operations.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Glue and Mastic Remover: Water-based glue and mastic remover; VOC rating 0 g/L.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 PROTECTION

- A. Protect surrounding surfaces of structure from harm resulting from cleaning of concrete.

3.3 CLEANING

- A. Clean up work site removing all run-off, dust, dirt, and grime as a result of work of this Section.

END OF SECTION 03 01 30.51



THIS PAGE INTENTIONALLY LEFT BLANK



SECTION 03 01 30.61 – RESURFACING OF 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
 - 1. Cleaning of existing concrete surfaces.
 - 2. Non-structural patching of existing concrete surfaces.
- B. Related Sections
 - 1. Section 03 30 00 “Cast-in-Place Concrete”
 - 2. Section 03 01 30.51 “Cleaning Cast-In-Place Concrete”

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.
- B. Product Data: Submit manufacturer’s complete technical data sheets for the following:
 - 1. Materials.
 - 2. Equipment.
- C. Samples: Submit mock-up samples of cleaned concrete surfaces as directed by the Commissioner.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.
- B. Mock-Ups (coordinate with 03 01 30.51): Provide mock-ups of each type of concrete surface to be patched and cleaned, to demonstrate typical cleaned concrete surface and standard of workmanship.
 - 1. Prior to providing mock-up of cleaned surfaces, submit samples of three different cleaning methods for review. Proceed with mock-up at pressure approved by Commissioner.
 - 2. At an on-site location to be selected by Commissioner, clean a 10 feet by 20 feet area.
 - 3. Obtain approval of mock-up locations from Commissioner prior to commencing cleaning.
 - 4. Notify Commissioner seven (7) days in advance of dates and times when mock-ups will be completed.



5. Complete mockup and sample panels using processes and techniques intended for use on permanent work. Mockup will include samples of control, construction, and expansion joints, and edges in sample panels and will be produced by the same workers who will perform the cleaning of concrete for the Project, utilizing all approved materials to be employed in the final cleaned surface.
 6. The final, approved and accepted field mockup will establish the visual standard for the work of this Section. Final approval will be based on approval of field mockup.
 7. Retain the samples utilized to complete the mockup, as well as the in-situ field mockup, through completion of the cleaning of concrete for use as a quality standard for finished work.
- C. Preinstallation Meetings: Conduct a preinstallation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements. Other items for agenda of preinstallation meetings include, but not be limited to, the following:
1. Environmental requirements.
 2. Scheduling and phasing of work.
 3. Coordinating with other work and personnel.
 4. Protection of adjacent surfaces.
 5. Surface preparation.
 6. Repair of defects and defective work prior to installation.
 7. Cleaning.
 8. Application of liquid sealer.
 9. Protection of finished surfaces after installation.

1.5 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.
- C. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels indicating brand name, directions for storage, directions for mixing with other components and directions for application.
- D. Storage and Protection
1. Store materials in compliance with manufacturer's written instructions to prevent deterioration from moisture or other detrimental effects.
 2. Dispense materials from factory-numbered and sealed containers. Maintain record of container numbers



1.6 ENVIRONMENTAL LIMITATIONS/ JOB CONDITIONS

- A. Comply with manufacturer's written instructions for substrate temperature and moisture content, ambient temperature and humidity, ventilation, and other conditions affecting cleaning of concrete operations.

PART 2 PRODUCTS

2.1 NON-STRUCTURAL PATCHING OF CONCRETE

- A. Use a blend of white Portland cement, grey Portland cement and a processed flyash product.
- B. Vary the proportions to get an exact color match and the material is mixed with a paddle mixer with water to a consistency of mayonnaise. Start out with a mix of equal parts by volume of the three cementitious parts and vary the white and grey proportions to adjust the resulting color. Try three different proportions on a test area and allow the to dry to determine the best match.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 PROTECTION

- A. Protect surrounding surfaces of structure from harm resulting from cleaning of concrete.

3.3 PATCHING OF CONCRETE

- A. Strip the paint and clean concrete as described above.
- B. Patching Mix Application Procedure
 - 1. After the concrete is clean remove any loose material from the areas to be patched.
 - 2. Apply the patch mix to a wetted surface with a non-metallic trowel or masonry bush and excess material removed with a soft towel.
- C. Texturing Procedure
 - 1. Experimentation may be necessary to perfect this procedure.
 - 2. Prepare boards with a slight raised grain either with light abrasive blasting, fine wire brushing or acid application.
 - 3. Press the board face into the applied pliable stiff surface.
 - 4. Alternative Application: Apply patch mix and texture the stiff surface with trowel and a stylus or similar tool to simulate the board texture.
 - 5. Prepare samples of varying sizes and types, like surface voids, corners, etc., in a location designated by Commissioner. Provide number of samples as designated by Commissioner.



3.4 REMOVING CARPET ADHESIVE FROM CONCRETE SLAB

- A. Scrape off glue using a scraper with a sharp razor edge. Sweep away dislodged loose glue.
- B. Loosen up remaining glue with hot water; allow hot water to mix with glue approximately 2 minutes. Scrub off moistened glue with concrete floor scrubber or scraper.
- C. Remove any remaining glue using a heavy-duty glue remover or mastic remover. Use a scraper or stiff scrubbing brush to remove any excess glue debris.
- D. Remove remaining glue from pores of concrete by sanding. Use an aggressive grit to remove remaining glue, then switch to finer grit (in the 300s range).

END OF SECTION 03 01 30.61



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 but is not limited to the following as shown on the drawings and as specified herein:
1. Foundation systems including pile caps, walls, architecturally exposed and insulated walls, mud slabs, beams, pilasters, pits and similar concrete.
 2. Slabs on grade.
 3. Structural slabs on grade.
 4. Structural slabs on metal deck.
 5. Cast-in-place slabs, beams, walls, and columns.
 6. Topping slabs
 7. Stair pan fills.
 8. Furnishing and installing all required anchors and inserts.
 9. Placing in the forms all inserts, anchors, anchor bolts, bearing plates and the like furnished by other subcontractors for casting into the concrete and cleaning of same after stripping of forms.
 10. Protection of all inserts, anchors, hangers, sleeves and supports furnished and set by others for the attachment of other work to the concrete, or required to permit the passage of other work through the concrete.
 11. Supply, fabricate and place all required reinforcing bars, mesh and other reinforcement for concrete where shown, called for, and/or required complete with proper supporting devices.
 12. Erection and removal of all formwork required to properly complete the work.
 13. Finishing of all concrete work as hereinafter specified.
 14. Curing and protection of all concrete work.
 15. Site concrete consisting of walls, pads, boxes and the like as shown on the drawings.
 16. Floor sealers and dust-proofing of all areas exposed and/or covered with carpet.
 17. Cutting, patching, grouting, repairing and pointing up as required.
 18. Under slab drainage course.
 19. Grouting of all beam bearing plates and column base plates.
 20. Embedded plates in all foundation walls.
 21. Equipment pads as required.
 22. All other work and materials as may be reasonably inferred and needed to make the work of this section complete.

- B. Related Sections:



1. Division 04 Section "Unit Masonry"
2. Division 05 Section "Structural Steel Framing"
3. Division 05 Section "Steel Decking"
4. Division 05 Section "Metal Fabrications"
5. Division 06 Section "Rough Carpentry"
6. Division 07 Section "Self Adhering Membrane Waterproofing"
7. Division 07 Section "Joint Sealants"

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: Submit data for materials and items, including the following:
 1. Reinforcement
 2. Supports for reinforcement
 3. Forming accessories
 4. Admixtures
 5. Patching compounds
 6. Waterstops
 7. Joint systems
 8. Curing compounds
 9. Dry-shake finish materials
 10. Others items as requested by Commissioner.
- C. Shop Drawings; Reinforcement: Submit original shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 "Details and Detailing of Concrete Reinforcement" showing bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures. The shop drawings must be prepared only by competent detailers, checked by the contractor prior to submission.
 1. The shop drawings must show construction, contraction and isolation joint locations and the added reinforcement required at same.
 2. Obtain and coordinate information for sleeves and openings in concrete, which are required for the work of other subcontractors. Make coordinated drawings showing size and location of openings and sleeves and incorporate this information on the reinforcing drawings.
 3. Only those splices indicated on the approved shop drawings will be permitted.
 4. Provide elevations of all foundation walls and other structural elements to a minimum 1/4" scale.
 5. Show walls to be insulated.
- D. Shop Drawings Formwork: Submit shop drawings for fabrication and erection of specific finished concrete surfaces. Show form construction including jointing, special form joint or reveals, location and pattern of form tie placement, and other items which affect exposed concrete visually. Commissioner's review is for general architectural applications and features only. Design of formwork for structural stability and efficiency is Contractor's responsibility, prepared by or under the supervision of a registered Professional Engineer (licensed in the State of New York) detailing fabrication, assembly, and support of formwork.



1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and reshoring installation and removal.
- E. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 1. Location of construction joints is subject to approval of the Commissioner.
- F. Contraction Joint Layout: Indicate proposed contraction joints required per the slab on grade typical detail located in the structural drawings.
 1. Location of contraction joints is subject to approval of the Commissioner.
- G. Scaling of the Commissioner's drawings is not permitted. This applies to hard paper, electronic, and all other versions.
- H. Samples: Submit samples of materials as requested by Commissioner, including names, sources and descriptions.
- I. Laboratory Test Reports: Submit laboratory test reports for concrete materials, mix design test and microwave test.
- J. Material Certificates: Provide materials certificates in lieu of materials laboratory test reports when permitted by Commissioner. Manufacturer and Contractor, certifying that each material item complies with, or exceeds, specified requirements must sign material certificates. Provide certification from admixture manufacturers that chloride content complies with specification requirements.
- K. Cold Weather and Hot Weather Concreting Procedures: Submit written descriptions of contractor's proposed cold weather and hot weather concreting procedures (as per descriptions provided Article 3.10 "Concrete Placement"), when applicable.
- L. Certification that pozzolanic materials conforms to ASTM C 618-01 (noting class C or class F), ASTM C 989 or ASTM C1240.
- M. Certified recycled steel content. Provide cut sheets clearly indicating whether the rebar used meets the minimums for post-consumer OR post-industrial recycled contents. Or, if cut sheets are not available, obtain a written affidavit from the manufacturer stating the recycled content percentage and if the recycled content is post-consumer or post-industrial.
- N. Formwork: Specify whether reusable, permanent, salvaged or new wood forms are to be used.
- O. Recycled Aggregate: Provide laboratory reports indicating that aggregate conforms to ASTM C33 for structural concrete or ASTM D1241-00 for sub-base material. Provide cut sheets clearly indicating the source, total weight and volume of the recycled aggregate. If aggregate provided is a mix of virgin and recycled aggregates obtain a written affidavit from the manufacturer stating the recycled content percentage



- P. VOC content for curing compounds, sealants and release agents: Provide a cut sheet and a Material Safety Data Sheet (MSDS) for each curing compound, sealant, hardener and release agent used highlighting VOC contents. VOC content must be less than or equal to limits stated under Part 2 "PRODUCTS".
- Q. Material compatibility submittal: see section 3.14 E.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."
- E. Codes and Standards: Comply with provisions of following codes, specifications, and standards, except where more stringent requirements are shown or specified:
 - 1. New York City Building Code, Latest Edition
 - 2. ACI 117 "Standard Specifications for Tolerances for Concrete Construction and Materials and Commentary."
 - 3. ACI 211.1 "Standard Practice for Selecting Proportions for Normal, Heavyweight and mass concrete."
 - 4. ACI 211.2, "Standard Practice for Selecting Proportions for Structural Lightweight Concrete."
 - 5. ACI 214R, "Evaluation of Strength Test Results of Concrete."
 - 6. ACI 232.2R, "Use of Fly Ash in Concrete."
 - 7. ACI 233R, "Guide to Use of Slag Cement in Concrete and Mortar."
 - 8. ACI 234, "Guide for the Use of Silica Fume in Concrete."
 - 9. ACI 301 "Specifications for Structural Concrete."
 - 10. ACI 302.1R "Guide for Concrete Floor and Slab Construction."
 - 11. ACI 304R, "Guide for Measuring, Mixing, Transporting and Placing Concrete."
 - 12. ACI 305R "Hot Weather Concreting."
 - 13. ACI 306R-10 "Guide to Cold Weather Concreting."
 - 14. ACI 308.1 "Standard Specification for Curing Concrete."
 - 15. ACI 309R, "Guide for Consolidation of Concrete."
 - 16. ACI 311.4R, "Guide for Concrete Inspections."
 - 17. ACI 315, "Details and Detailing of Concrete Reinforcement."
 - 18. ACI 318 "Building Code Requirements for Structural Concrete and Commentary."
 - 19. ACI 347 "Guide to Formwork of Concrete."
 - 20. Concrete Reinforcing Steel Institute, (CRSI) "Manual of Standard Practice."
 - 21. CRSI-WCRSI, "Placing Reinforcing Bars."



22. AWS D1.4, "Structural Welding Code Reinforcing Steel."
 23. The ACI Field Reference Manual, SP-15 must be kept at the job site, and the practices set forth therein must be strictly adhered to.
 24. ASTM Standards as applicable in the New York City Building Code and as noted in this specification.
 25. AASHTO T 318, "Standard Method of Test for Water Content of Freshly Mixed Concrete Using Microwave Oven Drying."
- F. Materials and installed work may require testing and retesting at anytime during progress of work. Tests, including retesting of rejected materials for installed work, will be done at Contractor's expense.
- G. Preconstruction Meeting:
1. At least 35 days prior to the 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 construction. The Contractor must send a pre-concrete conference agenda to all attendees 20 days prior to the scheduled date of the conference.
 2. The Contractor must require responsible representatives 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
 - e. Ready-mix concrete producer
 - f. Admixture manufacturer(s)
 - g. Concrete pumping equipment manufacturer.
 3. Minutes of the meeting must be recorded, typed and printed by the contractor and distributed by the contractor to all parties concerned within 5 days of the meeting. One copy of the minutes must also be transmitted to the following for information purposes: Commissioner
 4. The minutes must include a statement by the concrete contractor indicating that the proposed mix design and placing can produce the concrete quality required by these specifications.
 5. A minimum of a 4 cubic yard trial mixture containing all required admixtures must be placed at the job site using the accepted methods of placing, finishing and curing. All applicable tests including slump, strengthen, air content, permeability, and air content will be performed. This must occur at least four weeks before actual concreting operations with particular admixture begins. The admixture manufacturer(s) and inspectors must be present. The same testing should be done in the laboratory at the same time for comparison. A test sample should be done for each condition that is to be placed. Test sample will be for defining finish, form jointing and tie location. Provide separate pre-construction mock-ups for CONC-02 and CONC-03 to review the insulated poured in place wall as well as the exposed finish of the lot line wall.
 6. The Commissioner will be present at the conference. The Contractor must notify the Commissioner at least 10 days prior to the scheduled date of the conference.

1.5 PROJECT CONDITIONS



- A. The Contractor, before commencing work, must examine all adjoining work on which this work is in any way dependent for proper installation and workmanship according to the intent of this specification, and must report to the Commissioner any condition which prevents this contractor from performing first class work.
- B. Protection of Footings Against Freezing: Cover completed work at footing level with sufficient temporary or permanent cover as required to protect footings and adjacent subgrade against possibility of freezing; maintain cover for time period as necessary.
- C. Protect adjacent finish materials against spatter during concrete placement.
- D. Provide all barricades and safeguards at all pits, holes, shaft and stairway openings, etc., to prevent injury to workmen and others within and about the premises. Also provide all safeguards as required by the NYC Building Code and OSHA. Take full responsibility for all safety precautions and methods.
- E. Procedure of Work: The contractor must keep themselves constantly informed as to the progress of the work in the field, materials and workers ready to start work immediately when conditions of preceding work are available or ready, wholly or in part, so as not to delay the progress of building work or to interfere with the progress of work of other contractors, and in any event the contractor must, within 24 hours after notice from the City of New York, proceed with such work as directed to maintain the uninterrupted progress of the work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Forms for Exposed Finish Concrete: Unless otherwise indicated, construct of plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide form material with sufficient strength and thickness to withstand pressure of newly placed concrete without bow or deflection.
 - 1. Use plywood complying with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better mill oiled and edge-sealed, with each piece bearing legible inspection trademark.
 - 2. For concrete type CONC-02 and CONC-03 use MDO formwork, stainless steel screw ties with plastic cone and set back plug.



- B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Preference must go to salvaged or re-used Dimensional Lumber. Provide lumber dressed on at least 2 edges and one side for tight fit.
- C. Form Coatings: Provide VOC compliant commercial formulation form- coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces. Use biodegradable form release agent listed below or equivalent made from soy or rapeseed oil.
- | | |
|----------------------|-------------------------------------|
| 1. "Bio-Release EF" | Dayton Superior |
| 2. "Soy Form Away" | Cure & Seal by Natural Soy Products |
| 3. "Bio-Form" | Leahy-Wolf Company |
| 4. "Duogard II" | W. R. Meadows, Inc. |
| 5. "Atlas Bio-Guard" | Atlas Construction Supply, Inc. |
| 6. Or Approved Equal | |
- D. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
- E. Form Ties: Form ties and spreaders: prefabricated assemblies by Richmond; Superior, Dayton or approved equal. Wire ties may not be used. Ties for foundation work must be of snap design with removal cones and water seal washer.
1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
 2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.
 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing. For exposed finished concrete provide stainless steel screw ties with standard size cones, set back plug.

2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615/A 615 M, Grade 60.
- B. Weldable Reinforcing Bars: ASTM A 706/A 706M, Grade 60.
- C. Epoxy-Coated Reinforcing Bars: ASTM A 775, to be provided at CONC-02, CONC-03 and CONC-05.
- D. Steel Wire and Welded Wire Reinforcement: ASTM A 1064. Galvanized at exterior locations, conditions permanently exposed to weather and/or water, and where noted on drawings (plan and/or sections).
- E. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 , plain-steel bars, cut true to length with ends square and free of burrs.
- F. Epoxy-Coated Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 , plain-steel bars, ASTM A 775/A 775M epoxy coated.



- G. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating; compatible with epoxy coating on reinforcement and complying with ASTM A 775/A 775M.
- H. Zinc Repair Material: ASTM A 780, zinc-based solder, paint containing zinc dust, or sprayed zinc.
- I. Supports for Reinforcement: Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire reinforcement in place. Use wire bar type supports complying with CRSI specifications.
 - 1. For epoxy coated reinforcement provide plastic protected chairs and plastic ties. All imperfections in the epoxy coating are to be repaired prior to placement of concrete.
 - a. Use recycled plastic rebar supports. Subject to compliance with requirements, provide one of the following:
 - 1) International Plastics Group
 - 2) Eclipse Plastic
 - 3) Inland Concrete Products
 - 4) Or Approved Equal
 - 2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class I) or stainless steel protected (CRSI, Class 2), at a spacing not to exceed 4'-0" on center in either direction.

2.3 CONCRETE MATERIALS

- A. Portland cement: ASTM C 150, Types I, II, or I/II. Total percentage of Portland Cement is NOT to exceed 75% of the cementitious mix. Use one brand of cement throughout project, unless otherwise acceptable to Commissioner. Provide Pozzolans in mix per sections below:
 - 1. Pozzolans: These must be completely accounted for in the design mix. Mix design must meet minimum design requirements set in the contract documents. Additional admixtures may be required to meet early strength requirements and alternative cementitious material goals. If a "blended cement" is used which already contains a certain percentage of Pozzolans this content may offset or entirely satisfy the minimum percentage required.
 - a. Silica Fume: ASTM C 1240
 - b. Rice Hull (or "husk") Ash: ASTM C 618 Blended hydraulic cement, as defined by ASTM C 595 or ASTM C 1157
- B. Normal Weight Aggregates: ASTM C 33, and as herein specified. Provide aggregates from a single source for exposed concrete.



1. Local aggregates not complying with ASTM C 33 but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to Commissioner.
 2. Normal weight Fine Aggregate: washed, inert, natural or manufactured or combination thereof, sand conforming ASTM C33 gradation.
 3. Normal weight Coarse Aggregate: well graded crushed stone or washed gravel conforming to ASTM C33, sizes 57 for foundations and 67 for slabs and structure.
 - a. Recycled crushed concrete aggregate in concrete mixes is only to be used with approval of Commissioner. Recycled aggregate may be used only as a substitute for coarse aggregate and must also be washed and well-graded, conforming to ASTM C33.
 - b. For sub-base, slabs on grade and non-structural applications Recycled Aggregate Materials are NOT required to meet the ASTM C 33 standard. In addition to concrete rubble, glass, porcelain, and tire chips can be used as filler material. Any inert material conforming to ASTM D1241 is acceptable for the applications described in this paragraph.
- C. Lightweight Aggregates: Well-graded crushed expanded shale produced by rotary kiln method. Solite or equal, conforming to ASTM C330.
- D. Water: Free from oils, acids, alkali, organic matter and other deleterious material to conform to ASTM C94. ASTM C94 for gray water use in the production of ready mixed concrete per approval by the Commissioner.
- E. Air-Entraining Admixture: ASTM C 260.
1. Liquid air-entrainment: Subject to compliance with requirements, provide one of the following or approved equal:
 - a. "Airmix" Euclid Chemical
 - b. "Darex AEA" W. R. Grace
 - c. "MB-VR" Master Builders
- F. Water-Reducing Admixture: ASTM C 494.
1. Products: Subject to compliance with requirements, provide one of the following or approved equal:
 - a. "MasterPolyheed 997" Master Builders
 - b. "Euclid MR" Euclid Chemical
 - c. "WRDA 64" W. R. Grace.
- G. High-Range Water-Reducing Admixture (Superplasticizer): ASTM C 494, Type F or Type G and containing not more than 0.05 percent chloride ions.
1. Products: Subject to compliance with requirements, provide one of the following or approved equal:
 - a. "Eucon 37, 1037 or Plastol 5000" Euclid Chemical Co.
 - b. "Rheobuild 1000" Master Builders
 - c. "Glenium 7500" Master Builders



- d. "Daracem-100" W. R. Grace
- H. Water Reducing, Non-Corrosive Accelerating Admixture: The admixture must conform to ASTM C 494, Type C or E, and not contain more chloride ions than are present in municipal drinking water. 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. Accelerating admixtures are not to be used as antifreeze agents. Accelerating admixtures are permitted only upon review by Commissioner.
1. Products: Subject to compliance with requirements, provide the following or approved equal:
- a. "Accelguard 80" Euclid Chemical Co.
 - b. "Daraset" W. R. Grace
 - c. "Pozzutec 20" Master Builders.
- I. Water-Reducing, Retarding Admixture: ASTM C 494, Type D, and contain not more than 0.05 percent chloride ions.
1. Products: Subject to compliance with requirements, provide one of the following or approved equal:
- a. "Eucon Retarder 75" Euclid Chemical Co.
 - b. "Pozzolith 100XR" Master Builders.
 - c. "Plastiment" Sika Chemical Co.
 - d. "Daratard" W.R. Grace.
- J. Microsilica Admixture must be dry densified or slurry formed. Microsilica must come from the same source throughout the project. If a single source cannot be maintained, laboratory testing of each new source will be required before acceptance by the Commissioner at no cost to the City of New York.
1. Products: Subject to compliance with requirements, provide one of the following or approved equal:
- a. "Emsac F 100" Elkem Chemical, Inc.
 - b. "Eucon MSA" Euclid Chemical Co.
 - c. "Force 10,000" W. R. Grace
- K. Prohibited Admixtures: Calcium chloride, thiocyanates or admixtures containing more than 0.05 percent chloride ions are not permitted.
- L. Certification: Written conformance to the above-mentioned requirements and the chloride ion content of admixtures will be required from the admixture manufacturer prior to mix design review by the Commissioner.
- M. Macro-Fibers: Engineered macro-synthetic fibers.
1. Products: Subject to compliance with requirements, provide one of the following or approved equal:
- a. "Tuf-Strand SF" Euclid Chemical Co.
 - b. "Fibermesh 650" Propex Concrete Systems



- c. "Forta-Ferro" Forta
- N. Micro-Fibers: Engineered micro-synthetic fibers.
1. Products: Subject to compliance with requirements, provide the following or approved equal:
- | | |
|---------------------|-------------------------|
| a. "Ultrafiber 500" | Solomon |
| b. "Fiberstrand N" | Euclid Chemical Co. |
| c. "Fibermesh 150" | Propex Concrete Systems |
| d. "Ultra-Net" | Forta |
- O. Natural Fiber Reinforced Concrete: Natural fiber reinforced concrete is permitted only upon review by Commissioner. Refer to ACI 544.1R, chapter 5
- P. Corrosion Inhibitor: 30% calcium nitrite (where called for in the specifications or on the drawings). Subject to compliance with requirements, provide the following at 3 gal/cy:
- | | |
|----------------------|------------------|
| 1. "Eucon CIA" | Euclid Chemical |
| 2. "DCI" | W. R. Grace |
| 3. "Rheocrete CNP" | Master Builders. |
| 4. Or Approved Equal | |
- Q. Contractor will be required to provide information demonstrating successful use in prior placement involving all admixtures.

2.4 WATERSTOPS

- A. Self-Expanding Butyl Strip Waterstops: Manufacturers rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch.
1. Products: Subject to compliance with requirements, provide one of the following or approved equal:
- | | |
|---------------------------|---|
| a. "MiraSTOP" | Carlisle Coatings & Waterproofing, Inc. |
| b. "Waterstop-RX" | CETCO |
| c. "Conseal CS-231" | Concrete Sealants Inc. |
| d. "Swellstop" | Greenstreak |
| e. "Hydro-Flex" | Henry Company, Sealants Division |
| f. "Earth Shield Type 20" | JP Specialties, Inc. |

2.5 GROUT

- A. Non-Shrink, Non-Metallic Grout: The non-shrink grout must be a factory pre-mixed grout and must conform to ASTM C1107, "Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-Shrink)." In addition, the grout manufacturer must furnish test data from an independent laboratory indicating that the grout when placed at a fluid consistency must achieve 95% bearing under a 4' x 4' base plate.



1. Products: Subject to compliance with requirements, provide one of the following or approved equal:

- | | | |
|----|-----------------------|---------------------|
| a. | "Euco-NS" | Euclid Chemical Co. |
| b. | "Five Star Grout" | U.S. Grout Corp. |
| c. | "Masterflow 713 Plus" | BASF |

2.6 RELATED MATERIALS

- A. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 1241, Size 57, with 100 percent passing a 1-1/2 inch sieve and 0 to 5 percent passing a No. 8 sieve.
- B. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.
- C. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.

1. Products: Provide as applicable:

- a. Waterproof paper
- b. Polyethylene film
- c. Polyethylene-coated burlap

- D. Curing Compounds: The compound must conform to ASTM C 309. Limit VOC content to 130 g/L. Use water-based curing compound. For surfaces receiving both a curing compound and additional flooring, verify that the curing compound and additional flooring are compatible.

1. Products: Subject to compliance with requirements, provide one of the following or approved equal:

- | | | |
|----|-----------------------|---------------------|
| a. | "SealTight 1100" | W.R. Meadows |
| b. | "Kurez W VOX" | Euclid Chemical Co. |
| c. | "Everclear VOX" | Euclid Chemical Co. |
| d. | "VOCOMP-25" | W.R. Meadows |
| e. | "Krystal 15 Emulsion" | Kaufman |

- E. Sealers/Hardeners: For use on concrete surfaces that will remain exposed (including CONC-05 at the garage slab). Slabs that will receive additional flooring do not require sealing or hardening. Sealers and hardeners must conform to ASTM D1546, not yellow under ultraviolet light after 500 hours of test in accordance with and have a maximum moisture loss of 0.039 grams per sq. cm. when applied at a coverage rate of 250 sq. ft. per gallon. Limit VOC content to 130 g/L. Use water- or vegetable-based product.

1. Products: Subject to compliance with requirements, provide one of the following or approved equal:

- | | | |
|----|-----------------------|--------|
| a. | "MasterKure HD 200WB" | BASF |
| b. | "Euco Diamond Hard" | Euclid |
| c. | "Kure-N-Harden" | BASF |



- d. "Liqui-Hard Ultra" W.R. Meadows
- F. For CONC-05 use a Liquid Sealer/Densifier (see division 09 for traffic coating): The product must be a high performance, deeply penetrating concrete densifier conforming to ASTM C836; odorless, colorless, VOC - compliant, non-yellowing silicate based solution designed to harden, dustproof and protect and to resist black rubber tire marks on concrete surfaces. The compound must contain a minimum of 20% solids content of which 50% is silicate
- G. Evaporation Retardant:
1. Products Subject to compliance with requirements, provide one of the following or approved equal:
- | | |
|-----------------------|---------------------|
| a. "Eucobar" | Euclid Chemical Co. |
| b. "MasterKure ER 50" | BASF |
| c. "Evapre" | W.R. Meadows |
- H. Certify that all curing compounds, sealers and hardeners are compatible with all adhesive products intended for attaching co-lateral floor material. In conformance with ASTM F 710, coordination with flooring manufacturer is required to ensure concrete coatings will not obstruct the bond between the concrete and the adhesive. Ensure coatings and adhesives are "benignly compatible" -- in other words, do not combine substances whose constituents are reactive. Reactivity releases VOCs and /or other toxic fumes.
- I. Crack Sealer: Elastomeric liquid crack sealer resistant to water, gasoline, oil and salts (coordinate compatibility with traffic coating, see division 9).
1. Products: Subject to compliance with requirements, provide one of the following or approved equal:
- | | |
|----------------------------|---------------------|
| a. "Euclastic INS" | Euclid Chemical Co. |
| b. "Sikaflex Concrete Fix" | Sika |
| c. "Elasto Filler" | Bull-Bond |
- J. Underlayment Compound: Free flowing, self-leveling, pumpable cementitious base compound.
1. Products: Subject to compliance with requirements, provide the following or approved equal:
- | | |
|----------------------------------|---------------------|
| a. "Flo-Top 90 or Super Flo-Top" | Euclid Chemical Co. |
| b. "Ardex" | Ardex Co. |
| c. "Underlayment 110" | Master Builders |
- K. Bonding Admixture: The compound must be a latex, non-rewettable type.
1. Products: Subject to compliance with requirements, provide one of the following or approved equal:
- | | |
|-----------------|---------------------|
| a. "Flex-Con" | Euclid Chemical Co. |
| b. "Daraweld C" | W.R. Grace |
| c. "SBR Latex" | Euclid Chemical Co. |



- L. High Strength Polymer Repair Mortar: For form and pouring or large horizontal repairs, provide the flowable on-part, high strength repair mortar.
1. Products: subject to compliance with requirements, provide the following or approved equal by Commissioner:
 - a. "Eucocrete" The Euclid Chemical Co.
 - b. "Euco Speed MP" (Cold Weather) The Euclid Chemical Co.
 - c. "Emaco R" Master Builders.
 - d. "SikaTop-111 Plus" Sika
- M. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- N. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
1. Type IV for bonding hardened concrete to hardened concrete, and Type V for bonding freshly mixed concrete to hardened concrete.
- O. Expansion Joint Filler: ASTM D 1751.
1. Products: Subject to compliance with requirements, provide one of the following or approved equal:
 - a. "Homex 300" Homasote Company
 - b. "Fibre Expansion Joint" W.R. Meadows
 - c. "Standard Cork Expansion Joint Filler" APS Cork
- P. Water: Potable.

2.7 PROPORTIONING AND DESIGN OF MIXES

A. Preparation of Design Mixes

1. Form TR-3: 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.
2. All mix designs must be proportioned in accordance with Section 5.3, "Proportioning on the Basis of Field Experience and/or Trial Mixtures" of ACI 318 and prepared by a licensed testing laboratory approved by the City of New York, but paid for by the contractor. Submit mix designs on each class of concrete for review.
3. If previously used mixes are submitted, all materials must be from the same sources and with the same brand names as the previously utilized mix.



4. If trial batches are used, the mix design must be prepared by an independent testing laboratory and must achieve an average compressive strength 1200 psi higher than the specified strength. This over-design must be increased to $1.10f'_c + 700$ psi when concrete strengths greater than 5000 psi are used.
 5. The proposed mix designs must be accompanied by complete standard deviation analysis or trial mixture test data.
- B. Submit each proposed mix to the Commissioner for review at least 5 days prior to the pre-concrete conference. Do not begin concrete production until Commissioner has reviewed and approved mixes.
1. Submit Test reports for any pozzolans or slags indicating compliance with ASTM C 618 or ASTM C 989, respectively.
 2. Provide cut sheets clearly indicating the percentages of pozzolans or slags used in the mix design as replacement for Portland cement. Or, if cut sheets are not available, obtain a written affidavit from the manufacturer stating the percentage.
 3. Test reports for recycled aggregate indicating compliance with ASTM C 33. Provide cut sheets clearly indicating the percentage of aggregates used that are recycled. Or, if cut sheets are not available, obtain a written affidavit from the manufacturer stating the recycled content percentage and source or sources of the material.
 4. Provide cut sheets clearly indicating the percentage of sub-base and filler aggregate materials that are recycled. Or, if cut sheets are not available, obtain a written affidavit from the manufacturer stating the recycled content percentage and source or sources of the material.
- C. Design mixes to provide concrete with strength as indicated on drawings and schedules.
- D. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to City of New York and as accepted by Commissioner. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Commissioner before using in work.
- E. For exposed concrete elements (as defined by Commissioner), the mix design must be uniform throughout the project. The mix design must be approved by the Commissioner for use in any specific location. On site mixing will be prohibited without approval from the Commissioner.
- F. Admixtures:
1. Use water-reducing admixture or high range water-reducing admixture (superplasticizer) in all concrete as required for placement and workability.
 2. Use non-corrosive, non-chloride accelerating admixture in concrete slabs placed at ambient temperatures below 50°F (10°C).
Use high-range water-reducing admixture in pumped concrete, architectural concrete, parking structure slabs, fiber concrete, concrete required to be watertight, concrete with ultimate strength of 5,000 psi or more, and concrete with water/cement ratios below 0.50.
 3. Use air-entraining admixture in exterior exposed concrete, unless otherwise indicated. Exposure category for exterior concrete is F1. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus-or-minus 1-1/2 percent within following limits:



- a. Concrete structures and slabs exposed to freezing and thawing or deicer chemicals.
 - 1) 4.5 percent (exposure class F1, moderate exposure); 5.5 percent (exposure class F2 and F3, severe exposure): 1-1/2" maximum aggregate
 - 2) 4.5 percent (exposure class F1, moderate exposure); 6 percent (exposure class F2 and F3, severe exposure): 1" maximum aggregate
 - 3) 5 percent (exposure class F1, moderate exposure); 6 percent (exposure class F2 and F3, severe exposure): 3/4" maximum aggregate
 - 4) 5.5 percent (exposure class F1, moderate exposure); 7 percent (exposure class F2 and F3, severe exposure): 1/2" maximum aggregate
 - 5) 6 percent (exposure class F1, moderate exposure); 7.5 percent (exposure class F2 and F3, severe exposure): 3/8" maximum aggregate
 - b. Other Concrete: (not exposed to freezing, thawing, or hydraulic pressure): 2 percent to 4 percent air.
4. Use admixtures for water-reducing and set-control in strict compliance with manufacturer's directions.
- G. Water-Cement Ratio: Provide concrete for following conditions with maximum water-cement (W/C) ratios as follows:
1. Concrete for structural topping slab, poured in place slabs and grade beams and walls, over water, on ground or exposed to weather: W/C 0.40.
 2. Concrete on metal deck:
 - a. With specified minimum compressive strength not greater than 5,000 psi: 0.40.
 3. "Quick Dry" Concrete: 0.40.
 4. Subjected to freezing and thawing; W/C 0.45.
 5. Subjected to deicers/watertight: W/C 0.45.
 6. Reinforced concrete subjected to brackish water, salt spray or deicers; W/C 0.40.
- H. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
1. Ramp slabs and sloping surfaces: Not more than 3".
 2. Reinforced foundation systems, including mud slabs below hydrostatic slabs: Not less than 1" and not more than 3".
 3. Concrete containing HRWR admixture (superplasticizer): Not more than 9" unless otherwise approved by the Commissioner. The concrete must arrive at the job site at a slump of 2" to 3" (3" to 4" for concrete receiving a "shake-on" hardener or lightweight concrete), be verified, then the high-range water-reducing admixture added to increase the slump to the approved level.
 4. Other Concrete: Not less than 1" or more than 4".
- I. Chloride Ion Level: Chloride ion content of aggregate must be tested by the laboratory making the trial mixes. The total chloride ion content of the mix including all constituents must not exceed the limitations set forth in Table 4.4.1 of ACI 318 for concrete subjected to deicers or exposed to chloride in service (0.15% chloride ions by weight of cement).



2.8 CONCRETE MIXING

- A. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as herein specified.
- B. Provide batch ticket for each batch discharged and used in work, indicating project identification name and number, date, mix type, mix time, quantity, and amount of water introduced.
- C. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required. When air temperature is between 85°F (30°C) and 90°F (32°C), reduce maximum mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90°F (32°C), reduce maximum mixing and delivery time to 60 minutes.
- D. No water may be added after mixing to concrete containing HRWR (Superplasticizer). If loss of slump occurs, the concrete treated with HRWR may be redosed as long as a "flash set" has not occurred. Redosage procedures must be discussed and approved by the Commissioner and the manufacturer.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL

- A. Coordinate the installation of joint materials and vapor retarders with placement of forms and reinforcing steel. Coordinate with installation of horizontal and vertical waterproofing.

3.3 INSPECTION

- A. Examine all work prepared by others to receive work of this section and report any defects affecting installation to the Contractor for correction. Commencement of work will be construed as complete acceptance of preparatory work by others.

3.4 CONCRETE

- A. Concrete must develop the minimum compressive strengths shown on drawings at 28 days when sampled and tested in accordance with ASTM C 31 and C 39 with the maximum slump in accordance with the approved mix design.
- B. Concrete must be in accordance with the requirements and specifications of "Building Code Requirements for Structural Concrete" as modified by the New York City Building Code.



3.5 FORMS

- A. Design formwork to maximize its reusability, reduce resources devoted to formwork construction and minimize waste generated.
- B. Design, erect, support, brace and maintain formwork to support vertical and lateral, static, and dynamic loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structures are of correct size, shapes, alignment, elevation and position. Maintain formwork construction tolerances complying with ACI 347. Provide Class A tolerances for concrete exposed to view. Provide Class C tolerances for other concrete surfaces.
- C. Design formwork to be readily removable without impact, shocks or damage to cast-in-place concrete surfaces and adjacent materials.
- D. Construct forms to size shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, recesses, and the like, to prevent swelling and for easy removal.
- F. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.
- G. Chamfer exposed corners and edges as indicated, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
- H. Provisions for Other Subcontractors: Provide openings in concrete formwork to accommodate work of other subcontractors. Determine size and location of openings, recesses and chases from subcontractors providing such items. Accurately place and securely support items built into forms.
- I. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Retightening forms and bracing after concrete placement is required to eliminate mortar leaks and maintain proper alignment.

3.6 PLACING REINFORCEMENT

- A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.



- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials, which reduce or destroy bond with concrete.
- C. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.
- D. Place reinforcement to obtain at least minimum coverage's for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

3.7 JOINTS

- A. Construction Joints: Locate and install construction joints as indicated, or if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable to Commissioner.
- B. Provide keyways at least 1-1/2" deep in construction joints in walls, slabs and between walls and footings; accepted bulkheads designed for this purpose may be used for slabs.
- C. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints, except as otherwise indicated.
- D. Waterstops: Provide waterstops in construction joints as indicated. Install waterstops to form continuous diaphragm in each joint. Make provisions to support and protect exposed waterstops during progress of work. Fabricate field joints in waterstops in accordance with manufacturer's printed instructions, using manufacturer's specified welding irons.
- E. Isolation Joints in Slabs-on-Ground: Construct isolation joints in slabs-on-ground at points of contact between slabs-on-ground and vertical surfaces, such as column pedestals and elsewhere as indicated.
 - 1. Joint filler and sealant materials are specified in Article 2.6 "Related Materials"
- F. Contraction (Control) Joints in Slabs-on-Ground: Maximum joint spacing will be 36 times the slab thickness unless otherwise noted on the drawings. The dry cut saw must be used immediately after final finishing and to a depth of 1-1/2". A conventional saw must be used as soon as possible without dislodging aggregate and to a depth of 1/4 slab thickness.
 - 1. Joint sealant material is specified in Article 2.6 "Related Materials".

3.8 INSTALLATION OF EMBEDDED ITEMS



- A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of items to be attached thereto.
- B. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds.
- C. Embedded Plates at Foundation Walls: Install plate at top of forms so that exterior face of steel plate is level and plumb. Use construction documents for locations, sizes and elevations.

3.9 PREPARATION OF FORM SURFACES

- A. Clean re-used forms of concrete matrix residue, repair and patch as required to return forms to acceptable surface condition.
- B. If form-release compound is required, coat contact surfaces of forms with a form-coating compound before reinforcement is placed.
- C. Thin form-coating compounds only with thinning agent of type, and amount, and under conditions of form-coating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in forms or to come into contact with in- place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.
- D. Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel formwork is not acceptable.

3.10 CONCRETE PLACEMENT

- A. Ready-mix concrete must comply with the requirements of ASTM C 94 and ACI 304. All plant and transporting equipment must comply with the concrete plant standards and truck mixer and agitator standards of the National Ready Mix Concrete Association.
- B. Cold weather mixing procedures must be submitted to the Commissioner for approval.
- C. Notify Commissioner and City of New York's Inspector at least 36 hours (1 1/2 regular working days) before each pour so that forms and reinforcing may be examined. Do not place concrete until inspection has been made or waived.
- D. Preplacement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other subcontractors in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.



1. Apply temporary protective covering to lower 2' of finished walls adjacent to poured floor slabs and similar conditions, and guard against spattering during placement.
- E. As herein specified:
1. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.
- F. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 18" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints. Use internal vibrators penetrating both the top and preceding layers.
- G. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use equipment and procedures for consolidation of concrete.
- H. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6" into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.
- I. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
- J. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
- K. Slabs: Bring slab surfaces to correct level with straightedge and strikeoff. Use highway straightedge, bull floats or darbies to smooth surface free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations. See also Article 3.13 "MONOLITHIC SLAB FINISHES" below.
- L. Maintain reinforcing in proper position during concrete placement operations.
- M. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein specified.
1. When air temperature has fallen to or is expected to fall below 40°F (4°C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50°F (10°C), and not more than 80°F (27°C) at point of placement.
 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 3. Use only a non-corrosive, non-chloride accelerator. Calcium chloride, thiocyanates or admixtures containing more than 0.05% chloride ions are NOT permitted.



4. Care must be taken to store water-based curing and sealing compounds where they will not freeze. In most cases, they cannot be reconstituted after thawing.
- N. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.
1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90°F (32°C). Mixing water may be chilled, or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.
 2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
 3. Fog spray forms, reinforcing steel and subgrade just before concrete is placed.

3.11 FINISH OF FORMED SURFACES

- A. Concrete mixes containing pozzolans or slags do not set at the same rate or with the same bleed water characteristic as plain Portland cement. Therefore, attention must be directed to the proper procedures. Refer to ACI 232.2R and ACI 301.
- B. Rough Form Finish: For formed concrete surface not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4" in height rubbed down or chipped off. Provide this finish at CONC-02 and CONC-03 exterior side.
- C. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, such as waterproofing, damp-proofing, painting or other similar system. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed. Follow all requirements in ACI 301 for smooth form finish. Surface preparation for surfaces receiving waterproofing must be approved by the waterproofing manufacturer prior to construction.

3.12 FLOOR FLATNESS/LEVELNESS TOLERANCES

- A. FF defines the maximum floor curvature allowed over 24 in. Computed on the basis of successive 12 in. (300 mm) elevation differentials, FF is commonly referred to as the "Flatness F-Number".
- B. FL defines the relative conformity of the floor surface to a horizontal plane as measured over a 10 ft. (3.05 m) distance commonly referred to as the "Levelness F-Number".
- C. All floors must be measured within 72 hours of being poured and in accordance with ASTM E 1155 "Standard Test Method for Determining Floor Flatness and Levelness Using the "F Number" System (Inch-Pound Units).



- D. All slabs must achieve the specified overall tolerance. The minimum local tolerance (1/2 bay or as designated by the Commissioner) will be 2/3 of the specified tolerances.
- E. All elevated slabs must achieve the specified FL tolerance before the removal of the forms.
- F. All slabs on metal deck must achieve the specified FF.

3.13 MONOLITHIC SLAB FINISHES

- A. Float Finish: Apply float finish to slabs at crawl spaces, unless otherwise noted. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture. Surface must achieve an FF 30 - FL 25 tolerance.
- B. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed-to-view, and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or other thin film finish coating system, unless otherwise noted. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance and with a surface leveled to an FF 30/ FL 25 tolerance. Grind smooth surface defects, which would telegraph through applied floor covering system.
- C. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, and slab surfaces which are to be covered with membrane or elastic waterproofing, or sand-bed terrazzo, and as otherwise indicated, apply single trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming. Surface preparation for surfaces receiving waterproofing must be approved by the waterproofing manufacturer prior to construction
- D. Sealers, Hardeners and Liquid Densifiers: Apply a coat of the specified compound to all EXPOSED interior concrete floors where indicated on the drawings. This surface must be continuously moist cured by a method satisfactory to the Commissioner. Apply and mechanically scrub compound into the floor in strict accordance with the manufacturer's printed instructions.

3.14 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
 - 1. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.
 - 2. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.



3. Use wind breaks and sun shades to avoid plastic or drying shrinkage cracks during warm, dry or windy weather. Evaporation retardant must be as specified in Article 2.6 "RELATED MATERIALS".
 4. Care must be taken to store water based curing and sealing compounds where they will not freeze. In most cases, they cannot be reconstituted after thawing.
- B. Curing Methods: Perform curing of concrete by moisture curing, moisture-retaining cover curing, curing and sealing compound, and by combinations thereof, as herein specified.
1. Provide moisture curing by following methods.
 - a. Keep concrete surface continuously wet by covering with water.
 - b. Continuous water-fog spray.
 - c. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.
 2. Provide moisture-retaining cover curing as follows:
 - a. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 3. Use moisture curing or moisture retaining cover curing at all surfaces to receive waterproofing and / or roofing. This applies to all surfaces to be covered with finish or coating material applied directly to concrete, such as waterproofing, dampproofing, membrane roofing, flooring, painting, and other coatings and finish materials.
- C. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
- D. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of the specified curing compound or a continuous moist curing method approved by the Commissioner.
- E. Certify that all curing compounds, sealers and hardeners are compatible with all adhesive products intended for attaching co-lateral floor material. In conformance with ASTM F710, coordination with flooring manufacturer is required to ensure concrete coatings will not obstruct the bond between the concrete and the adhesive. In addition, ensure coatings and adhesives are "benignly compatible" -- in other words, do not combine substances whose constituents are reactive.
- F. Sealer and Dustproofer: Apply a second coat of the specified curing and sealing compound to exposed interior slabs not subjected to vehicular traffic, noted on the drawings. These slabs must have received an initial coat of the curing and sealing compound.



3.15 SHORES AND SUPPORTS

- A. Comply with shoring and reshoring in multistory construction as herein specified.
- B. Extend shoring from ground to roof for structures 4 stories or less, unless otherwise permitted.
- C. Extend shoring generally at least 4 floors under floor or roof being placed for structures over 5 stories. Shore floor directly under floor or roof being placed, so that loads from construction above will transfer directly to these shores. Space shoring in stories below this levels in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members where no reinforcing steel is provided. Extend shores beyond minimums to ensure proper distribution of loads throughout structure. Contractor must provide the services of a registered Professional Engineer (licensed in the State of New York) to design the shoring, and determine timing of removal.
- D. Remove shores and reshore in a planned sequence to avoid damage to partially cured concrete. Locate and provide adequate reshoring to safely support work without excessive stress or deflection.
- E. Keep reshores in place a minimum of 15 days after placing upper tier, and longer if required, until concrete has attained its required 28-day strength and heavy loads due to construction operations have been removed.

3.16 REMOVAL OF FORMS

- A. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50°F (10°C) for 12 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.
- B. Formwork supporting weight of concrete, such as beam soffits, joints, slabs and other structural elements, may not be removed in less than 14 days and until concrete has attained design minimum compressive strength at 28-days. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members.
- C. Form facing material may be removed 4 days after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

3.17 RE-USE OF FORMS

- A. Clean and repair surfaces of forms to be re-used in work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.
- B. When forms are intended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Commissioner.



3.18 MISCELLANEOUS CONCRETE ITEMS

- A. Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other subcontractors, unless otherwise shown or directed, after work of other subcontractors is in place. Mix, place and cure concrete as herein specified, to blend with in- place construction. Provide other miscellaneous concrete filling shown or required to complete work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.
- D. Grout base plates and foundations as indicated using specified free-flowing non-shrink grout. Use non-metallic grout for exposed conditions, unless otherwise indicated.
- E. Steel Pan Stairs: Provide concrete fill for steel pan stair treads and landings and associated items. Cast-in safety inserts and accessories as shown on drawings. Screeds, tamp, and finish concrete surfaces as scheduled.

3.19 CONCRETE SURFACE REPAIRS

- A. Prior to all repairs, an as-built condition sketch and method of repair must be submitted to the Commissioner for review and approval.
- B. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Commissioner. Contractor to propose repair technique to Commissioner for aesthetic approval.
- C. Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with a bonding grout containing the specified bonding admixture. Place patching mortar after while bonding grout is still tacky.
- D. For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.
- E. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Commissioner. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets; fins and other projections on surface; and stains and other discoloration's that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or pre-cast cement cone plugs secured in place with bonding agent.



- F. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.
- G. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueens of slope, in addition to smoothness, using a template having required slope.
- H. Repair finished unformed surfaces that contain defects, which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01" wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets, and other objectionable conditions.
- I. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days, except at hydrostatic slabs.
- J. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. The specified underlayment compound or repair topping may be used when acceptable to Commissioner.
- K. Repair defective areas, except random cracks and single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4" clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact and finish to blend with adjacent finished concrete. Cure in the same manner as adjacent concrete.
- L. Repair isolated random cracks and single holes not over 1" in diameter by dry-pack method. Groove top of cracks and cutout holes to sound concrete and clean of dust, dirt and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part Portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry-pack after bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.
- M. Structural Repair: All structural repairs must be made with prior approval of the Commissioner as to method and procedure, using the specified polymer repair mortar and/or specified epoxy adhesive. Where epoxy injection procedures must be used, an approved low viscosity epoxy made by the manufacturers previously specified must be used. In addition, all cracks must be filled with the specified crack sealer or other method as approved by the Commissioner. All garage slabs must be repaired prior to the slab being treated with the specified penetrating anti-spalling sealer.
- N. Underlayment Application: Leveling of floors for subsequent finishes may be achieved by use of specified underlayment material. Underlayment application must achieve the tolerances specified in Article 3.13 "MONOLITHIC SLAB FINISHES" above.



- O. Specified Polymer Horizontal Repair Mortar: All exposed floors must be leveled, where required, with the specified self-leveling repair topping.
- P. Repair Methods not specified above may be used, subject to acceptance of Commissioner.

3.20 FOUNDATION WALLS

- A. The contractor must form and leave openings in walls as shown on drawings and approved shop drawings for work of other contractors. These openings must be temporarily closed and when so directed, the contractor must point up in solid and neat manner with waterproofed cement.

3.21 WORK IN CONNECTION WITH SUBCONTRACTORS

- A. Sleeves, pockets, openings, etc., must be set in the concrete walls and arches as required by the mechanical subcontractor as shown on approved shop drawings; these must be encased or built into the concrete work and must be properly placed and secured in position in the forms before concrete is placed.
- B. Provide all chases, pipe slots, etc., required by the mechanical subcontractor (see mechanical drawings), constructed as shown on the approved shop drawings.
- C. Leave temporary access panels where required to install mechanical equipment as required by subcontractors affected. Panels must be formed with construction joints as specified. Details for such panels must be submitted to Commissioner for approval.
- D. Coordinate all penetrations, cutting, and patching with waterproofing subcontractor.

3.22 CUTTING AND PATCHING

- A. Contractor will be responsible for all cutting, removing and patching work where concrete surfaces are not installed within the limits shown on the drawings or specified herein. All such work must meet with the approval of the Commissioner.
- B. Where cutting and patching is required, such cutting will be done at the expense of Contractor but must be performed by the subcontractor for concrete work.
- C. The location and extent of cutting in completed concrete work and the patching thereof must meet with the approval of the Commissioner.

3.23 QUALITY CONTROL TESTING DURING CONSTRUCTION

- A. Employ a testing laboratory to perform tests and to submit test reports.
- B. City of New York to provide special inspections per the New York City Building Code and the requirements of all applicable ACI standards.



- C. At locations previously indicated in this specification and on the contract drawings, verify the use of non-magnetic materials. No magnetic materials are permitted in locations where prohibited by this specification or the contract drawings.
- D. Sampling and testing for quality control during placement of concrete may include the following, as directed by Commissioner.
1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
 2. Slump: ASTM C 143; one test at point of discharge for each truck; additional tests when concrete consistency seems to have changed.
 3. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231 pressure method for normal weight concrete; one for each truck of air-entrained concrete.
 4. Concrete Temperature: Test hourly when air temperature is 40°F (4°C) and below, and when 80°F (27°C) and above; and each time a set of compression test specimens made.
 5. Compression Test Specimen: ASTM C 31; one set of 5 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
 6. Compressive Strength Tests: ASTM C 39; one set for each day's pour exceeding 25 cu. yds. plus additional sets for each 50 cu. yds. over and above the first 25 cu. yds. of each concrete class placed in any one day; one specimens tested at 7 days, three specimens tested at 28 days, and one specimens retained in reserve for later testing if required.
 - a. When frequency of testing will provide less than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.
 - b. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
 - c. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.
 7. Water Cement Ratio Test: Check water content of concrete in accordance with 'Standard Method of Test for Water Content of Freshly Mixed Concrete Using Microwave Oven Drying, AASHTO DESIGNATION: TP 23, SHRP DESIGNATION: 2027' for testing procedure. Frequency of this test must be the same as that of compressive strength tests, noted above.
 8. Floor Preparation to Receive Resilient Flooring: For any concrete that receives resilient flooring, test concrete in accordance with ASTM F 710 prior to acceptance by City of New York.
 9. Test results will be reported in writing to Commissioner and Contractor within 24 hours after tests. Reports of compressive strength tests must contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7-day tests and 28-day tests.
 - a. Non Compliance: All test reports indicating non-compliance must be faxed immediately to all parties on the test report distribution list and the hard copies submitted on different colored paper.



- b. Nondestructive Testing: Windsor probes, sonoscope, or other non-destructive device may be permitted but may not be used as the sole basis for acceptance or rejection.
- 10. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Commissioner. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Contractor will pay for such tests when unacceptable concrete is verified.

END OF SECTION 03 30 00



SECTION 03 33 00 - ARCHITECTURAL 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 architectural cast-in-place concrete.
- B. Related Sections
 - 1. Section 03 30 00 - Cast-in-Place Concrete

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Samples - Submit
 - 1. Cement; 3 to 6 oz. sample of cement submitted prior to design mixes and submitted for each delivery of each cement type to the batch plant during construction. Label sample with date, truck number, mill, lot number and bin number to which delivered.
 - 2. Fine aggregate; each type, 1 lb.
 - 3. Coarse aggregate; each type, 1 lb.
 - 4. Form contact materials; each type, 12" square with flange.
 - 5. Form gaskets; each type, 12" long.
 - 6. Forms for reveals and rustication; each type, 12" long.
 - 7. Reinforcement supports, chairs, tie wire; each type.
 - 8. Form ties; each type.
 - 9. 12' x 12' x 2-1/2" thick samples with finish and treatment required for each type of cast-in-place concrete work using a mix of the required ingredients, strength and color matching the designated color sample. Concrete samples are to be cast vertical against the same form material to be used in the construction. Resubmit samples until approved by the Commissioner; include the following finishes:
 - a. Off the form.
 - b. Light abrasive blast finish.
 - c. Heavy abrasive blast finish.



- d. Acid etched.
- e. Water washed.

10. Full size mock-up panels.

- C. Shop Drawings: Prepare shop drawings for approval, including plans, elevations, sections, details and schedules as required to fully illustrate the work, including the Mock-up, and to meet project conditions. Submit shop drawings including, but not be limited to, the following:

1. Formwork

- a. Submit detailed drawings showing the location of each panel including shop fabricated joints, field splice joints, tie locations, embedment locations, and clean-out openings. Specifically show details of bulkheads, reveals, recesses and corner assemblies and the means to be used to seal all joints and to maintain alignment.
- b. Shop drawings must signed and sealed by a Professional Engineer licensed in the State of New York.

2. Reinforcing Steel: Comply with Section 03 30 00 "Cast-in-Place Concrete."

- a. Indicate cover, placing passages, accessories and any special detailing.

3. Placing: Submit deposit sequence within each placement, including equipment and projected time between placements.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. In addition to requirements shown or specified herein and in Section 03 30 00 "Cast-in-Place Concrete," comply with the recommendations of Chapter 11, Formwork Architectural Concrete, and Special Publication No. 4, Formwork for Concrete and ACI 303.1 "Standard Specification for Cast-In-Place Architectural Concrete," as published by ACI.
- C. Installer Qualifications: An entity meeting the requirements of the DDC General Conditions Section 014000 "Quality Requirements," Article 1.7.C.1.

1.5 MOCK-UP

- A. Do not proceed with construction of the mock-up until all other samples are approved by the Commissioner.
- B. Mock-up: Construct a separate 4' high x 4' wide x 1'-6" thick panel on the job site. It is the intent of this specification that the mock-ups serve as the ultimate basis for final in-place work. As such, all shop drawings, details, techniques, materials, formwork, and crews and foremen used to achieve the final approved mock-ups must also be utilized for further in-place work.
- C. Coordinate with other trades performing work on the mock-up.



- D. Prior to placing architectural concrete erect the mock-up at the job site, where directed, consisting of the elements indicated and conforming with the building details. Provide footings and bracing as required or needed to ensure continuous stability of the mock-up.
- E. Install, patch, and finish concrete as specified for permanent work. Ensure that all agents and admixtures used in forming and pouring concrete can be cleaned from the work without staining, spotting, etc. Mock-up, when approved by the Commissioner, will serve as the approved sample for architectural concrete work as to color, texture, patching and appearance.
- F. If mock-up is not approved by Commissioner, remove and replace with others at no additional cost to the City of New York.
- G. Protect and maintain approved mock-up throughout construction period and remove only when directed by the Commissioner.

1.6 MINIMUM QUALITY REQUIREMENTS

- A. ACI Requirements 347.3R
 - 1. Table 3.1a Description of formed surface categories (CSC): CSC3.
 - 2. Table 3.1b
 - a. Description of visible effects on as-cast formed surfaces: T3.
 - b. Surface Irregularities: S14.
 - c. Color Uniformity: CU3
 - 3. Table 3.1c Form Facing categories: FC3.
 - 4. Table 3.1.d Surface Void Ratio: SVR3.
 - 5. Table 3.1.d Construction and Facing Joints: CJ4.

1.7 CONSTRUCTION CONFERENCE

- A. Within thirty (30) days following Notice to Proceed, schedule a meeting at a mutually agreeable time to include the Commissioner, the Concrete Supplier and the Formwork Manufacturer to discuss materials, methods of work and forming systems for architectural concrete work.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

- A. Cement and Aggregates: Supply cement and aggregates from one domestic raw material and manufacturing source. Do not change source or type of cement or aggregate without Commissioner's written approval.
 - 1. Portland Cement: ASTM C150 White.
 - 2. Fine Aggregate: ASTM C33, clean natural sand, consistent in color and gradation in screens finer than #16.



3. Coarse Aggregate: ASTM C33, clean crushed stone, free of material finer than #165 screen.

B. Admixtures

1. Air Entraining: Conform to ASTM C260, product compatible with other ingredients.
2. High Range Water Reduction (Plant batched superplasticizer): ASTM C-404, Type F or G containing no chlorides.
 - a. Basis of Design: Subject to compliance with requirements, provide Rheobuild 716 by Masterbuilders or comparable product by one of the following:
 - 1). W.R. Grace
 - 2). Euclid
 - 3). Or approved equal.
3. Other Admixtures: Do not use unless submitted for review and acceptance. Provide admixtures certified in writing by the manufacturer to be in compliance with ASTM C494.
4. Color Admixtures
 - a. Basis of Design: Subject to compliance with requirements, provide Chromix by L.M. Scofield Co. or comparable product by one of the following:
 - 1). Davis Colors
 - 2). Lehigh Cement
 - 3). Or approved equal.
 - b. Color: As selected by the Commissioner.

- C. Water: Conform to ACI 301, Chapter 2, Paragraph 203.

2.2 FORMWORK MATERIALS

- A. Form Facing: Form flat wall surfaces with plastic impregnated (min. 165 gr.), multi-layer (min. 14 plys/in), birch plywood, 3/4" thick.
1. Basis of Design: Subject to compliance with requirements, provide Wisa Elephant or comparable product by one of the following:
 - a. Dayton
 - b. Fitzgerald
 - c. Or approved equal.
- B. Form Gaskets (for sealing form panel joints): Closed cell, foam rubber or neoprene, with pressure sensitive paperbacked adhesive on surfaces to be bonded to forms. Provide gaskets of sufficient thickness, widths, and compressibility for specific use.
- C. Gasket adhesive remover must not discolor concrete and thoroughly remove any adhered adhesive.
- D. Reveal Formers and Reformers: Resilient elastomeric with a wood core.
- E. Form Release Coating: Colorless, non-staining and having no deleterious effect on the concrete.



- F. Form Ties (Cone/Tube/Rod type with screw ties): Tapered stud She-Bolts, He-Bolts or Through-the-wall tapered ties or an approved equal. Ties will leave a hole of not more than 9/16" in dia. on the concrete surface, and no metal closer than 1" from the surface. Use ties with external spreading devices. Use stainless steel leave in material.
1. Product: Subject to compliance with requirements, provide one of the following:
- Williams Form Engineering; She-Bolt
 - Dayton/Superior Co.; He-Bolt
 - Gates & Sons; Through-Taper
 - Or approved equal.
- G. Reinforcing: Provide as specified in Section 03 30 00 "Cast-in-Place Concrete" except as hereafter modified:
- Spacing and Support Devices: High density plastic or steel wire with plastic coated feet (dipped type). Color of the plastic: Match the concrete color.
 - Tie Wire: Non-corrosive plastic coated tie wire at exposed surfaces or for all work above an exposed soffit or ceiling.

2.3 MISCELLANEOUS MATERIALS

- A. Waterproofing Sealer: Sealer must be compatible with all other sealants it comes in contact with (i.e. expansion joints, sealants or window etc.).
1. Basis of Design: Subject to compliance with requirements, provide Lithofin PSI – Premium Silicone Impregnator by VIC International Corporation or comparable product by one of the following:
- ProSoCo
 - Miracle Sealants
 - Or approved equal.
- B. Sealant: Provide sealant for concrete to concrete in revealed expansion, construction and control joints as specified in Section 07 92 00 "Joint Sealers."
- C. Concrete Etching Solution: Commercial concrete cleaner containing solvents, chloride acid, and stain removers.
- D. Curing Materials: Colorless and conforming to ASTM C309.
- E. Any other miscellaneous materials required, but not specified herein: Conform to the requirements of Section 03 30 00 "Cast-in-Place Concrete."

2.4 MIXES

- A. General: Comply with Section 03 30 00 "Cast-in-Place Concrete" except that slump must be 4" plus or minus 1/2".
- B. Provide water reducing agent in all architectural concrete.



- C. Mix: Designed with low water content (max. 2"). Attain fluidity with addition of high range water reducing agent to a slump of 6" + 1" (including high range water reducing agent in color admixture).

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 FORMWORK

- A. Comply with Section 03 30 00 "Cast-in-Place Concrete" except as hereinafter specified.
 - 1. Formwork foreman must be experienced in architectural concrete formwork.
 - 2. Design forms to permit easy removal. Prying against the face of concrete will not be allowed.
 - 3. The forms must be completely rigid and strong enough to withstand without deflection, movement, or leakage, the full liquid head, and the high hydraulic pressures which result from rapid filling and high-frequency vibration.
 - 4. Use screw-type fastening devices to align and close joints at contact face. Yoke beams and columns where possible with threaded rods and use diagonal rods to hold horizontal wales at corners. Install rods so that the tightening action acts to close form joints.
 - 5. Form Panel Joints: Seal all joints in formwork, wherever located, to remain watertight. Seal as follows:
 - a. Caulked - Butt board ends and plywood edges sealed on contact surfaces.
 - b. Gasketed - Joints erected and stripped in field. Form to form or form to concrete.
- B. Reveal Formers and Reformers: Fabricate and fasten to avoid protruding splinters which may become embedded in the concrete. Fasten to hold alignment during placing.
- C. Construction Joints: Make joints only at revealed form joint locations shown on the architectural drawings. Determine spacing between construction joints according to the following:
 - 1. Maximum Area of Wall Placement: 300 sq. ft.
 - 2. Maximum Dimension: 15 ft.
 - 3. Gasket the formwork for second placements of construction joints and hold tight to the in-place concrete to prevent fluid loss.
- D. Plastic Surfaced Plywood: See architectural drawings for pattern of joints. Back fasten all contact material to supports. Penetrating the face is not permitted. Drill tie holes from contact face using brad point bits. Seal all tie holes and cut edges as directed by the manufacturer.
- E. Form Ties: Locate as detailed on drawings symmetrically in level horizontal rows and plumbed vertically. Ties shown may be used as dummy ties or working ties. Draw tie cones tight against the contact face. Maintain reusable portions of form ties free of rust and damage.



- F. Reuse of Forms: Forms may be reused only when properly maintained and in a satisfactory condition and approved by Commissioner. Forms which cannot be tightly butted and made watertight may not be reused. If reuse of forms is approved by Commissioner, clean forms, and repair damaged surfaces.
- G. Cleaning and Coating of Forms: Clean all form contact faces uniformly and coat with coat of specified form release coating per manufacturer's written instructions. Remove excess form coating and do not allow coating to come in contact with previously placed concrete against which fresh concrete will be placed.
- H. Water Stops: Apply strip to primed concrete surface as directed by the manufacturer. Position strip at edge of joint adjacent to earth for sub-grade installation and inboard of the exterior layer of reinforcing steel for above-grade installations.

3.3 FORMWORK TOLERANCES

- A. Hydraulic Pressure: Design Forms, studs and walers to limit deflections between supports and stiffening members to L/400 of the span.
- B. Finish Lines: Position formwork to maintain hardened concrete finish lines within the following permissible deviations.
 - 1. Variations from Plumb
 - a. In 10 ft. $\pm 1/8$ in.
 - 2. Cross-Sectional Dimensions
 - a. Minus 1/8 in.
 - b. Plus 1/4 in.
 - 3. Surface Tolerances
 - a. Maximum offset between butt joints of individual or ganged forms 1/32 in.
 - 4. Line of troweled edge at top of spandrel in 10 ft. $\pm 1/8$ in.

3.4 REINFORCEMENT

- A. General: Comply with Section 03 30 00 "Cast-in-Place Concrete" except as hereinafter modified:
 - 1. Concrete coverage over reinforcing steel, including bands must be no less than 2 in. for architectural concrete surfaces, including beam bottoms. Notify the reinforcing steel fabricator that strict compliance to coverage requirements and bent bar details is extremely important.
 - 2. Cut tie wires as closely as possible to the bars, and bend behind the bars in such a manner that concrete placement will not force the wire ends to the exposed concrete surfaces.
 - 3. Provide an unobstructed passage, min. 10" long, between the layers of reinforcing steel for placement of tremmies and trunks in placing the concrete. Provide passage maximum of 8'-0" apart, 4'-0" from each corner.



3.5 PLACING CONCRETE

- A. Coordination: Coordinate batch plant, transit, conveying and placing operations so that all concrete is in its final position within 1-1/2 hrs. (1 hr. when temperature is above 90 deg. F.) from the time the mix is charged with water. Perform this coordination so that any deposit load placed in the forms will be covered by a subsequent deposit within 15 minutes and in a continuous manner. Plan and direct truck delivery, truck changing, crane positions, bucket size, tremmie numbers and location, lift heights, etc. toward achieving homogeneous and consistent placements.
- B. General: Place concrete in accordance with Section 03 30 00 "Cast-in-Place Concrete" except as hereinafter modified:
 - 1. Clean truck mixer drums thoroughly prior to batching. Load truck mixers at the volume which will ensure a uniform batch at the slump specified. In the event that mixing is not uniform, the truck may either be rejected and not used on the project, or if warranted, allowed to mix only batches which will ensure delivery of a uniform concrete of the specified slump.
 - 2. Handle concrete from the mixer to the place of final deposit as rapidly as practical by methods which prevent separation or loss of the ingredients.
 - 3. Clean transporting and handling equipment at frequent intervals and flush thoroughly with water before and after each day's run.
- C. Retempering: Do not place concrete in forms after it has taken initial set. Retempering of concrete which has partially set is prohibited.
- D. Clean Formwork: Formwork must be clean and free from papers, sawdust, dirt and debris immediately prior to and during the time concrete is placed thereon. Clean spaces thoroughly prior to closing formwork and maintain clean until concrete is placed. For formwork which will be in place and closed while other work is being carried out which could impair its cleanliness, provide with clean-out panels in surfaces not exposed to view, or with panels following approved joint lines; note panels on shop drawings. Just prior to placing concrete thoroughly inspect the interior of formwork and clean out all debris with vacuum cleaners, magnets, air or water jets as required.
- E. Vibration: Compact concrete thoroughly by vibrating using internal vibrators only to produce a dense, homogeneous mass without voids or pockets. Place vibrators in the concrete vertically and thoroughly blend adjacent deposits and layers. After top out leveling of all exposed spandrels, allow the concrete to set 10 to 20 minutes; then give a final vibration, drawing the head out slowly to remove entrapped air. Hard trowel surface immediately thereafter.
- F. Perform all vibrating operations by the same skilled person responsible for vibrating acceptable concrete in the mock-ups.

3.6 CURING AND PROTECTION

- A. Hot Weather Protection: Comply with Section 03 30 00 "Cast-in-Place Concrete."
- B. Curing: Apply curing compound immediately after form removal in accordance with manufacturer's recommendations for maximum moisture retention and colorless application.



- C. Protect all horizontal and vertical corners of concrete for full length or full height of exposed corner with continuous wood corner guards. In areas where high activity warrants, protect all vulnerable surfaces.

3.7 FORMED CONCRETE FINISHES AND TREATMENTS

- A. Finish and Treatment of Formed Concrete Surfaces: Architectural concrete formed surfaces will have "as-cast" finish, using forms specified and where indicated on drawings. Concrete surfaces will also receive the following treatment as indicated below:
 - 1. Dressing, patching, texturing by etch cleaning, light and heavy blasting, and water washing, and the application of a water repellent.
- B. Final Finish Types: Apply the following finish types as required below:
 - 1. Dressing: Removal of all runs, splatters, fins, projections, and stains, in a manner which avoids scarring, staining or scratching the surface.
 - 2. Patching Exposed Concrete: It is the intent of these specifications that the concrete work will be performed in a manner that no patching of exposed concrete will be required. In the event remedial action is accepted as a means of rendering work acceptable it will consist of patching with a texture-matched technique and color matched mortar. Only areas designated by Commissioner will be patched. Perform patching after the application of texture treatment and before the water repellent application.
 - 3. Texturing of Concrete: Provide the following treatment at all exposed surfaces:
 - a. Light abrasive blast finish to match approved samples and mock-up.
 - b. All concrete to be treated must be a minimum of twenty-one (21) days old.
 - c. Thoroughly clean work areas of waste material as soon as each segment of work is completed, and protect work which may be damaged by this operation in an accepted manner. Be responsible for fallout and for protecting persons, adjacent work and property.
 - d. Etch Cleaning
 - 1). Apply cleaner in an even manner break to break and joint to joint of surface, allow to set and flush in a consistent manner throughout project. Proceed in a manner approved by the product manufacturer.
 - 2). Treatment will produce a "matte" surface by just removing the surface of the cement skin. Do not expose aggregate larger than that passing #20 screen.
 - e. Tie Holes: Tie holes requiring plugging will be plugged with concrete. Spalled or defective tie holes may be required to be patched with approved patching mortar, but only patch if required by Commissioner.
 - 4. Do not chamfer corners, whether horizontal or vertical.
 - 5. Apply waterproofing sealer to wall surfaces in one application following manufacturer's instructions.

END OF SECTION 03 33 00



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 self-leveling cement compound applied over existing concrete substrates; 1/4" thickness minimum.
- B. Related Sections
 - 1. Section 03 30 00 "Cast-in-Place Concrete"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Submit catalog information and product data for material to be used.
- C. Submit approval letter as required by Article 3.2, para. B. herein.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Applicator: Company specializing in performing the work of this Section with a minimum of 3 years' experience and properly instructed by the manufacturer of the product used.

1.5 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during, and after installation, and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

1.6 REGULATORY REQUIREMENTS

- A. Conform to New York City Building Code for combustibility or flame spread requirements.

1.7 MOCK-UP

- A. Construct a mock-up of underlayment material, 8 feet long by 8 feet wide.
- B. Locate where directed by the Commissioner.
- C. Approved mock-up may remain as part of the Work.



1.8 JOB REQUIREMENTS

- A. Do not install underlayment until floor penetrations and peripheral work are complete.
- B. Maintain minimum ambient temperatures of 50 degrees F. 24 hours before, during, and 72 hours after installation of underlayment.
- C. During the curing process, ventilate spaces to remove excess moisture and until underlayment is dry, allow a minimum of seven (7) days.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Subject to the requirements specified herein, provide one of the following products:
 - 1. "K-15" made by Ardex.
 - 2. "Supercap SC500" by Laticrete.
 - 3. "Level Set 200" by ProSpec.
 - 4. "DSP-520" made by H.B. Fuller Co.
 - 5. "Super Flo-Top" made by Euclid Chemical Co.
 - 6. "Ultraplan 1 Plus" by the Mapei Corp. (rapid setting).
 - 7. "Novoplan 2" by the Mapei Corp. (standard setting).
 - 8. "Level Quick R/S" or "E/S" by Custom Building Products.
 - 9. Or approved equal.

2.2 MATERIALS

- A. Underlayment: One of the above listed products.
- B. Water: Potable and not detrimental to underlayment mix materials.
- C. Primer: Manufacturer's recommended type.
- D. Joint and Crack Filler: Latex based.

2.3 MIXING

- A. Site mix materials in accordance with manufacturer's instructions.
- B. Mix to achieve following characteristics:
 - 1. Density: 115 lb./cu. ft. minimum dry density.
 - 2. Compressive Strength: 4,000 psi minimum in accordance with ASTM C 109.



3. Fire Hazard Classification: Flame/Smoke rating of 0/0 in accordance with ASTM E 286.

C. Mix to self-leveling consistency.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSPECTION

A. Examine the areas and conditions where cement leveling compounds are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

B. Manufacturer's representative must inspect surfaces to receive cement leveling compound and approve those surfaces in writing to the Commissioner prior to start of application.

3.3 PREPARATION

A. Vacuum clean surfaces; remove any material (curing compounds, film, dirt) that would be detrimental to bond of cement leveling compound.

B. Prime substrate in accordance with manufacturer's instructions. Allow to dry.

C. Close floor openings.

3.4 APPLICATION

A. Install underlayment in accordance with manufacturer's instructions.

B. Place to minimum 1/4" thickness.

C. Transition to existing floor; use stiff mix to slope to align with existing adjacent floor.

3.5 CURING

A. Air cure in accordance with manufacturer's instructions.

3.6 APPLICATION TOLERANCE

A. Top Surface: Level to 1/8 inch in 10 ft.

3.7 PROTECTION OF FINISHED WORK

A. Do not permit traffic over unprotected floor underlayment surfaces and until underlayment is completely dry.

END OF SECTION 03 54 16



**Department of
Design and
Construction**

FMS No. - LNCA13HAM
Issue Date - 04/15/2022

THIS PAGE INTENTIONALLY LEFT BLANK



SECTION 04 01 20.91 - UNIT MASONRY RESTORATION

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. Cleaning existing face brick walls.
 - 2. Repointing existing face brick walls.
 - 3. Patching and restoration of existing damaged face brick.
 - 4. Replacing existing damaged face brick.
 - 5. Staining existing brick.
- B. Related Sections
 - 1. Section 07 92 00 "Joint Sealants"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: Submit manufacturers' technical data for each product indicated including recommendations for their application and use and VOC compliance. Include test reports and certifications substantiating that products comply with requirements.
- C. Restoration Program: Submit written program for each phase of restoration process including protection of surrounding materials on building and site during operations. Describe in detail materials, methods and equipment to be used for each phase of restoration work.
- D. Samples: For the following:
 - 1. Each type, color, and texture of pointing mortar in the form of sample mortar strips, 6" long by ½" wide, set in aluminum or plastic channels.
 - a. Include with each Sample a list of ingredients with proportions of each. Identify sources, both supplier and quarry, of each type of sand and brand names of cementitious materials and pigments if any.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".



- B. Brick Masonry Restoration/Repointing Specialist Qualifications: An entity meeting the requirements of the DDC General Conditions Section 014000 "Quality Requirements," Article 1.7.C.1.
- C. Field Supervision: Brick masonry restoration/repointing specialist firms shall maintain experienced full-time supervisors on Project site during times that brick masonry repointing work is in progress.
- D. Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging masonry. Include provisions for supervising performance and preventing damage.
- E. Field-Constructed Mock-Ups: Prior to start of general masonry restoration, prepare the following sample panels on the building where directed by Commissioner. Obtain Commissioner's acceptance of visual qualities before proceeding with the work. Retain acceptable panels in undisturbed condition, suitably marked, during construction as a standard for judging completed work.
 - 1. Cleaning: Demonstrate materials and methods to be used for cleaning each type of masonry surface and condition on sample panels of approximately 25 sq. ft. in area.
 - a. Test adjacent non-masonry materials for possible reaction with cleaning materials.
 - b. Allow waiting period not less than seven (7) calendar days, after completion of sample cleaning to permit study of sample panels for negative reactions.
 - 2. Repointing: Prepare two (2) separate sample areas of approximately 3' high by 6' wide for each type of repointing required, one for demonstrating methods and quality of workmanship expected in removal of mortar from joints and the other for demonstrating quality of materials and workmanship expected in pointing mortar joints.
 - 3. Patching: Prepare sample area approximately 3'-0" high by 6'-0" wide for demonstrating techniques and quality of terra cotta and masonry restoration work.
 - 4. Provide mock-ups for dutchmen, epoxy restoration, cracking restoration and pointing.
- F. Stain Mock-Ups: Prepare three 24" x 24" mock-ups of brick staining, not on the existing façade, but with stand-alone brick wall samples.
- G. Preconstruction Testing of Existing Mortar: Test according to ASTM C 295, modified as agreed by testing service and the Commissioner for Project requirements, to determine proportional composition of original ingredients, sizes and colors of aggregates, and approximate strength.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Carefully pack, handle, and ship masonry units and accessories strapped together in suitable packs or pallets or in heavy cartons. Unload and handle to prevent chipping and breakage.
- B. Deliver other materials to site in manufacturer's original and unopened containers and packaging, bearing labels as to type and names of products and manufacturers.
- C. Protect masonry restoration materials during storage and construction from wetting by rain, snow or ground water, and from staining or intermixture with earth or other types of materials.
- D. Protect grout, mortar and other materials from deterioration by moisture and temperature. Store in a dry location or in waterproof containers. Keep containers tightly closed and away from open flames. Protect



liquid components from freezing. Comply with manufacturer's recommendations for minimum and maximum temperature requirements for storage.

1.6 PROJECT CONDITIONS

- A. Clean masonry surfaces only when air temperatures are 40 deg. F. and above and will remain so until masonry has dried out, but for not less than seven (7) days after completion of cleaning.
- B. Do not repoint mortar joints or restore masonry unless air temperatures are between 40 deg. F. and 80 deg. F. and will remain so for at least forty-eight (48) hours after completion of work.
- C. Prevent grout or mortar used in repointing and restoration work from staining face of surrounding masonry and other surfaces. Remove immediately grout and mortar in contact with exposed masonry and other surfaces.
- D. Protect sills, ledges and projections from mortar droppings.

1.7 SEQUENCING/SCHEDULING

- A. Perform masonry restoration work in the following sequence:
 - 1. Restore existing masonry including replacing existing masonry with new masonry materials.
 - 2. Rake-out existing mortar from joints indicated to be repointed.
 - 3. Repoint existing mortar joints of masonry indicated to be restored.
 - 4. Clean existing masonry surfaces.
 - 5. Stain existing masonry surfaces.

PART 2 PRODUCTS

2.1 MASONRY MATERIALS

- A. Brick: ASTM C 216, to match existing brick in size, shape, texture, color and absorption, final selection by the Commissioner.
- B. Salvaged Brick: Use salvaged brick from existing façade wherever possible. Clean off residual mortar. Match original bond.
- C. Mortar Materials
 - 1. Portland Cement: ASTM C 150, Type 1, standard color, one source.
 - 2. Hydrated Lime: ASTM C 207, Type S.
 - 3. Aggregate: Clean, washed, buff colored sand, graded per ASTM C 144.
 - 4. Water: Clean, fresh and suitable for drinking.



2.2 CLEANING MATERIALS AND EQUIPMENT

- A. Water for Cleaning: Clean, potable, free of oils, acids, alkalis, salts, and organic matter.
- B. Alkaline Prewash Cleaner: Manufacturer's standard alkaline cleaner for prewash applications only which are followed by acidic cleaner of type indicated for afterwash.
- C. Cleaner: Manufacturer's standard strength non-acidic masonry restoration cleaner or approved equal.
- D. Liquid Strippable Masking Agent: Manufacturer's standard liquid, film forming, strippable masking material for protecting glass, metal and polished stone surfaces from damaging effect of acidic and alkaline masonry cleaners.
- E. Spray Equipment: Provide equipment for controlled spray application of water and chemical cleaners, at rates required by the manufacturer, measured at spray tip, and for volume.
 - 1. For spray application of chemical cleaners provide low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with cone-shaped spray-tip.
 - 2. For spray application of water provide fan-shaped spray-tip which disperses water at angle of not less than 15 degrees.

2.3 PATCHING MATERIALS

- A. Patching Mortar: Single-component, cementitious, mineral-based mortar equal to "M70 Jahn Restoration Mortars" made by Cathedral Stone Products Inc., US Heritage, York Building or approved equal.
- B. Formulate patching compound for terra cotta in colors and textures to match each unit being patched.

2.4 MORTAR MIXES

- A. Measuring and Mixing: Measure cementitious and aggregate material in a dry condition by volume or equivalent weight. Do not measure by shovel, use known measure. Mix materials in a clean mechanical batch mixer.
 - 1. Mixing Pointing Mortar: Thoroughly mix cementitious and aggregate materials together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix which will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 1-to-2 hours. Add remaining water in small portions until mortar of desired consistency is reached. Use mortar within thirty (30) minutes of final mixing; do not retemper or use partially hardened material.
- B. Colored Mortar: Produce mortar of color required by use of selected coloring agent. Mortar to match existing.
- C. Do not use admixtures of any kind in mortar, other than colorant.
- D. Mortar Proportions
 - 1. Pointing Mortar for Brick: One part white Portland cement, 2 parts lime and 6 parts colored mortar aggregate. Add colored mortar pigment to product mortar colors required to match.
 - 2. Rebuilding Mortar: Comply with ASTM C 270, Proportion Specification, Type N, with cementitious material content limited to Portland cement-lime and coloring agent.



2.5 STAINING MATERIALS

- A. Basis-of-Design Product: Subject to compliance with requirements:
 - 1. PermaTint Limited; 1020 SiLazur; color PT3003 Cadet Grey and 1050 Fixative
- B. Subject to compliance with requirements, products that may be incorporated into the Work include the following:
 - 1. BrickImaging; Stayntech
 - 2. Keim; Restauro-Lasur
 - 3. Or approved equal.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSPECTION

- A. Examine the areas and conditions where masonry restoration and cleaning are to be performed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected by the Contractor in a manner acceptable to the Commissioner.

3.3 PROTECTION

- A. General: Comply with recommendations of manufacturers of chemical cleaners for protecting building surfaces against damage from exposure to their products.
- B. Protect persons, motor vehicles, surrounding surfaces of building whose masonry surfaces are being restored, building site, and surrounding buildings from injury resulting from masonry restoration work.
 - 1. Prevent chemical cleaning solutions from coming into contact with pedestrians, motor vehicles, landscaping, buildings and other surfaces which could be injured by such contact.
 - 2. Do not clean masonry during winds of sufficient force to spread cleaning solutions to unprotected surfaces.
 - 3. Dispose of run-off from cleaning operations by legal means and in manner which prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.
 - 4. Erect temporary protection covers over pedestrian walkways and at points of entrance and exit for persons and vehicles which must remain in operation during course of masonry restoration work.
- C. Protect glass, unpainted metal trim and polished stone from contact with acidic chemical cleaners by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.



Apply masking agent to comply with manufacturer's recommendations. Do not apply liquid masking agent to painted or porous surfaces.

3.4 CLEANING EXISTING MASONRY, GENERAL

- 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.
- B. Use only those cleaning methods indicated for each masonry material and location.
- C. Perform each cleaning method indicated in a manner which results in uniform coverage of all surfaces, including corners, moldings, interstices and which produces an even effect without streaking or damage to masonry surfaces.
- D. Rinse off chemical residue and soil by working upwards from bottom to top of each treated area at each stage or scaffold setting.
- E. Water Application Methods: Prior to chemical cleaning, apply water application to mock-ups by spray at various pressures to determine if masonry surfaces can be cleaned adequately and to the Commissioner's satisfaction in this manner. If water applications prove ineffective, proceed with chemical cleaners.
- F. Chemical Cleaner Application Methods: Apply chemical cleaners to masonry surfaces to comply with chemical manufacturer's recommendations. Do not allow chemicals to remain on surface for periods longer than that indicated or recommended by manufacturer.
 - 1. For hard to remove dirt or grime, apply pre-wash cleaner prior to application of chemical cleaner; follow manufacturer's instructions.

3.5 BRICK REMOVAL AND REBUILDING

- A. Brick Removal
 - 1. Carefully remove by hand any brick which are damaged, spalled or deteriorated. Cut out full units from joint to joint and in manner to permit replacement with full size units.
 - 2. Support and protect masonry indicated to remain which surrounds removal area.
 - 3. Salvage as many whole, undamaged bricks as possible.
 - 4. Remove mortar, loose particles and soil from salvaged brick by cleaning with brushes and water. Store brick for reuse.
 - 5. Clean remaining brick at edges of removal areas by removing mortar, dust, and loose debris in preparation for rebuilding.
- B. Brick Rebuilding
 - 1. Install new or salvaged brick to replace removed brick. Fit replacement units into bonding and coursing pattern of existing brick. If cutting is required use motor driven saw designed to cut masonry with clean, sharp unchipped edges.
 - 2. Lay replacement brick with completely filled bed, head and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet clay brick which have ASTM C 67 initial rates of



absorption (suction) of more than 30 grams per 30 sq. in. per minute. Use wetting methods which ensure that units are nearly saturated but surface dry when laid. Maintain joint width for replacement units to match existing.

3. Tool exposed mortar joints in restored areas to match joints of surrounding existing brickwork.

3.6 REANCHORING VENEERS

- A. Install masonry restoration anchors in horizontal mortar joints and according to manufacturer's written instructions. Install at not more than 16 inches o.c. vertically and 32 inches o.c. horizontally unless otherwise indicated. Install at locations to avoid penetrating flashing.
- B. Recess anchors at least 5/8" from surface of mortar joint and fill recess with pointing mortar.

3.7 REPOINTING EXISTING MASONRY

A. Joint Raking

1. Rake out mortar from joints to depths equal to 2-1/2 times their widths but not less than 1/2" nor 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 any masonry units which become damaged.
 - a. Cut out old mortar by hand with chisel and mallet.
 - b. Power operated rotary hand saws and grinders will be permitted for horizontal joints only but only with specific written approval of Commissioner based on submission by Contractor of a satisfactory quality control program and demonstrated ability of operators to use tools without damage to masonry. Quality control program shall include provisions for supervising performance and preventing damage due to worker fatigue.

B. Joint Pointing

1. Rinse masonry joint surfaces with water to remove any dust and mortar particles. Time application of rinsing so that, at time of pointing, excess water has evaporated or run off, and joint surfaces are damp but free of standing water.
2. Apply first layer of pointing mortar to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8" until a uniform depth is formed. Compact each layer thoroughly and allow to become thumbprint-hard before applying next layer.
3. After joints have been filled to a uniform depth, place remaining pointing mortar in three (3) layers with each of first and second layers filling approximately 2/5 of joint depth and third layer the remaining 1/5. Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing bricks have rounded edges recess final layer slightly from face. Take care not to spread mortar over edges onto exposed masonry surfaces, or to feathered edge mortar.



4. When mortar is thumbprint hard, tool joints to match original appearance of joints, unless otherwise indicated. Remove excess mortar from edge of joint by brushing.
5. Cure mortar by maintaining in a damp condition for not less than seventy-two (72) hours.
6. Where repointing work precedes cleaning of existing masonry allow mortar to harden not less than thirty (30) days before beginning cleaning work.

3.8 STAINING EXISTING BRICK

- A. Comply with manufacturer's written instructions.

END OF SECTION 04 01 20.91



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. Concrete block walls and partitions.
 - 2. Face brick.
 - 3. Metal joint reinforcing, anchors, ties, weeps, closures and related accessories for masonry.
 - 4. Control and expansion joints in masonry, filled with joint fillers.
 - 5. Through-wall flashing.
 - 6. Cavity drainage material.
 - 7. Chases, recesses, pockets and openings in masonry as required for installation of work by others.
 - 8. Building in of items furnished by others into masonry, including access doors, door frames, anchors, sleeves and inserts, and other similar items to be embedded in masonry.
 - 9. Grouting in of metal items built into masonry work.
 - 10. Protection, pointing and cleaning of masonry.
- B. Related Sections
 - 1. Section 03 30 00 "Cast-in-Place Concrete"
 - 2. Section 05 50 00 "Metal Fabrications" for steel lintels.
 - 3. Section 07 21 00 "Thermal Insulation"
 - 4. Section 07 62 00 "Sheet Metal Flashing and Trim"
 - 5. Section 07 84 00 "Firestopping"
 - 6. Section 07 92 00 "Joint Sealants"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".



B. Submit Shop Drawings for the following:

1. Anchoring details.
2. Control and expansion joint locations and details.
3. Special brick shapes, including large scale shop drawings showing configuration and dimensions.
4. Flashing at typical lintels indicating relationship of flashing to lintel hangers.

C. Submit Samples for the following:

1. Each type of face brick in sufficient number and color (not less than 5) to show full range of color, texture and shade. Submit certification that brick meets ASTM standards specified herein.
 - a. Submit samples of all special shapes required showing color range and sizes.
2. Joint reinforcing, each type, width and proposed location (labeled).
3. Anchors, wedges and ties, each type, width and proposed location (labeled).
4. Joint filler, each type.
5. Flashing, including splice sample, 12" long.
6. Mortar color, 12" long cured sample.

D. Submit technical and installation information for the following:

1. Mortar materials, each material and mortar type.
2. Certification of mortar mix.
3. Flashing material, descriptive literature.
4. Concrete block, joint reinforcing, anchors, ties and joint filler; submit manufacturer's technical and descriptive literature.
5. Submit certifications of compliance with ASTM C 90, C 331 and UL 618 prior to any job site delivery.

E. Cleaning Procedures: Submit proposed procedures and materials for cleaning masonry work; including certification that cleaner will not adversely affect stone, gaskets, sealants, etc.

1.4 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Job Mock-Up

1. Prior to installation of masonry work, erect sample wall panel mock-up using materials, bonding patterns and joint tooling required for final work and including cavity wall, masonry sill, typical pier with returns and stone base, window unit and sill, projecting courses, anchors and reinforcement as detailed. Provide special features as directed by the Commissioner for caulking and contiguous work. Build mock-up at the site, 4' x 4' size as directed by the Commissioner, indicating the proposed range



of colors, textures and workmanship to be expected in the completed work. Reconstruct mock-up if directed by the Commissioner until it meets with Commissioner's approval. Obtain Commissioner's acceptance of visual qualities of the mock-up before start of masonry work. Retain mock-up during construction as a standard for judging completed masonry work. Do not alter, move or destroy mock-up until work is completed and accepted by the Commissioner. Use sample panels to test proposed cleaning procedures after sample panel meets with Commissioner's approval.

2. Approved sample panel must remain on view at the site until completion of face brick work and will establish the technical and aesthetic standards for the Project.
3. Commissioner will direct distribution of brick color and texture variation within mock-up.

C. Factory Control

1. The Commissioner reserves the right to visit the brick manufacturer's facility and review pre-sorting so that all brick falls within a color range acceptable to the Commissioner.
2. Construct 4' x 4' mock-ups at the factory using the face brick specified. This mock-up, after approval of the Commissioner, will become the quality control panel for the selected brick.
3. Prior to any shipment of the face brick from the factory, the Commissioner reserves the right to inspect the brick for the thoroughness of the pre-sorting and to reject any brick which in his opinion do not fall within acceptable color range.

D. Pre-Construction Conference: Prior to installation of masonry and associated work, arrange a meeting with Masonry Subcontractor, installers of related work, and other entities concerned with masonry wall performance, including the Commissioner and City of New York. Record discussions and agreements and furnish copy to each participant. Provide at least seventy-two (72) hours' advance notice to participants prior to convening conference. Review methods and procedures related to masonry work, including, but not limited to, the following:

1. Review masonry requirements (drawings, specifications and other Contract Documents).
2. Review required submittals, both completed and yet to be completed.
3. Review and finalize construction schedule related to masonry work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
4. Review required inspection, testing, certifying and material usage accounting procedures.
5. Review weather and forecasted weather conditions, and procedures for coping with unfavorable conditions.
6. Coordinate work with air/vapor barrier membrane and related flashing, review details to avoid conflicts.

1.5 PRODUCT HANDLING

- A. General:** Deliver, store, handle and protect all materials from damage, moisture, dirt and intrusion of foreign matter. Store all masonry units and mortar materials on raised platforms and under ventilated and waterproof cover. Store packaged materials in manufacturer's unopened containers, marked with



manufacturer's name and product brand name. Immediately reseal containers after partial use. Remove and replace damaged materials.

- B. Masonry Units: Pack, deliver and store to prevent breakage, cracking, chipping, spalling or other damage. Store, protect and ventilate units at project site.
- C. Aggregate: Store with provisions for good drainage.
- D. Reinforcement and Anchors: Store and protect so that when placed, joint reinforcement and anchors will be free of soil, dirt, ice, loose rust, scale, or other coatings which would destroy or reduce bond with mortar and will not be disfigured or bent out of shape.

1.6 JOB CONDITIONS

- A. In cold weather, when the outside temperature is below forty (40) degrees F., conform to the requirements of "Cold Weather Masonry Construction and Protection Recommendations" publication by Brick Industry Association (BIA). No anti-freeze admixtures are permitted.
 - 1. In addition, conform to the following:
 - a. Masonry materials must be warmed as required.
 - b. Brickwork must be protected a minimum of 24 hours after installation so as to maintain enough heat for hydration of the cement in the mortar.
- B. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg. F. and above. In addition, conform to the following:
 - 1. Masonry materials must be cool.
 - 2. Mortar must be used within 2 hours of initial mixing.
- C. Protection of Masonry: During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 - 1. Extend cover a minimum of 24" down both sides and hold cover securely in place.
 - 2. Where one wythe of multi-wythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24" down face next to unconstructed wythe and hold cover in place.
- D. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.



4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt on completed masonry.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Conform to the following non-cumulative tolerances; rebuild any masonry work not meeting these standards as directed by the Commissioner.

1. Variation from the plumb:
 - a. In lines and surfaces of columns, walls and arrises:
 - 1). In 10 feet 1/8"
 - 2). In any story of 25 feet maximum 1/4"
 - 3). In 40 feet or more 1/4"
 - b. For external corners, expansion joints and other conspicuous lines:
 - 1). In any story of 25 feet maximum 1/4"
 - 2). In 40 feet or more 3/8"
2. Variation from the level or the grades indicated on the drawings; for exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines:
 - a. In any bay or 20 feet maximum 1/4"
 - b. In 40 feet or more 1/4"
3. Variation of the linear building lines from established position in plan related portion of columns and partitions:
 - a. In any bay or 20 feet maximum 1/4"
 - b. In 40 feet or more 1/2"
4. Variation in cross-sectional dimensions of columns and in thickness of walls:
 - a. Minus 1/8"
 - b. Plus 1/8"
5. Variation in dimensions of masonry openings:
 - a. Horizontal dimension -0" + 1/16"
 - b. Vertical dimension +0" - 1/16"

- B. Conform to the requirements of the following:

1. 2016 "Building Code Requirements for Masonry Structures," (TMS 402/602-16).
2. 2016 "Specification for Masonry Structures," (TMS 602-16).
3. Brick Industry Association (BIA) "Technical Notes on Brick Construction."
4. New York City Building Code.



5. Comply with New York City Official Compilation of the Rules of the City of New York regarding "Impact Resistant Stair and Elevator Enclosures" when such enclosures are of masonry construction.
- C. Testing for Efflorescence: Test selected face brick for efflorescence in accordance with ASTM C 67. If, at the end of the test period, the samples of brick or mortar show efflorescence, the materials represented will be rejected and new materials must be re-tested. Repeat this process until no efflorescence appears. Testing will be done by an independent testing laboratory at the expense of the Contractor; submit test results in writing to the Commissioner.

2.2 MATERIALS

A. Standard Concrete Block

1. Portland cement, ASTM C 150, Type 1, low alkali (less than 0.6%), single source for entire project.
2. Aggregates, ASTM C 331, lightweight expanded shale, clay or slate aggregates, manufactured by the rotary kiln process.
 - a. Product: Subject to compliance with requirements, provide one of the following:
 - 1). Northeast Solite Corp.; Solite
 - 2). Norlite LLC; Norlite
 - 3). Buildex Inc.; Haydite
 - 4). Or approved equal.
 - b. Block scheduled to receive painted finish must contain normal weight aggregate meeting ASTM C 33 in addition to lightweight aggregate in order to receive a smooth, uniform finish.
3. Concrete Masonry Units: Load bearing lightweight aggregate concrete masonry units conforming to the requirements of ASTM C 90, Type 1.
 - a. Block behind face brick and block for rated walls: 75% solid units.
 - b. All other block may be hollow units.
4. The producer of the concrete masonry units shall furnish certification from an independent testing laboratory confirming that all 8" or larger masonry units meet all of the UL 618 requirements for two (2) hours or better (as required), referencing full scale fire test reports (ASTM E 119). All 4" and 6" units shall conform to "National Bureau of Standards" and "National Research Council" full scale fire tests.
5. Sizes and Shapes: Nominal face size 8" x 16" by thickness as indicated on drawings, with stretcher units, jamb units, header units, square corner units (at ends and corners of exposed or painted work), sash units (at control joints within masonry wall), lintel units and other special shapes and sizes required to complete the work.
6. Finish: For exposed or painted block surfaces, in addition to ASTM requirements, provide block with uniformly dense, flat, fine grain texture, with no cracks, chips, spalls, or other defects which would impair appearance. For concealed CMU, provide surfaces free from deleterious materials that would stain plaster or corrode metal.
7. Curing: Steam cure all concrete block and air dry for not less than thirty (30) days before delivery.
8. Density: One hundred and five (105) lbs. per cubic foot maximum.



9. Shrinkage: 0.065% maximum when tested in accordance with ASTM C 426-16, Standard Test Method for Linear Drying Shrinkage of Concrete Masonry Units.
10. Water Content
 - a. At the time of delivery to the job site, concrete masonry units must have a value, in weight of contained water, of not more than thirty (30) percent of the fully saturated content for the unit tested.
 - b. Ship all units from the factory, and store at the job site, with all necessary protection to prevent increase of water content from rain and other sources.

B. Brick

1. Basis-of-Design Product: Subject to compliance with requirements, provide Belden Brick Company (The); Modular Landmark Gray Smooth A, 14-39 (darker brick) and Modular No. 661 Smooth A, 16-20 (lighter brick) or comparable products by one of the following:
 - a. Glen-Gery Corporation
 - b. Watertown Brick Company
 - c. Or approved equal.
2. Size: Unless otherwise indicated, provide modular bricks size as follows - 3-5/8" h. x 2-1/4" th. x 7-5/8" w. to match existing brick and approved sample.
3. Facing Brick: ASTM C 216, Grade SW, Type FBX, match existing brick and approved sample.
4. Where brick is fully concealed provide common brick conforming to ASTM C 62, Grade SW.
5. Provide all special molded shapes as indicated on the drawings.
6. For sills, caps and similar applications resulting in exposure of brick surfaces which otherwise would be concealed from view, provide uncured units with all exposed surfaces finished.

C. Joint Reinforcing for Masonry Walls

1. Non-Seismic Construction: For anchoring face brick to CMU back-up, provide welded "ladder" design, of 3/16" dia. gauge steel rods with adjustable 3/16" wire rectangular pintle anchors fastened to reinforcement 16" o.c. Provide special formed prefabricated pieces at corners and intersections of walls or partitions. Anchors to extend at least 2" into face of brick. Show anchor locations on approved shop drawings.
 - a. Provide reinforcing assembly with hot dip galvanized steel finish conforming to ASTM A 153 with zinc coating of 1.5 oz. of zinc per sq. ft. after fabrication.
 - b. Basis of Design: Subject to compliance with requirements, provide Hohmann & Barnard; Ladder Type 270 with Lox All Adjustable Anchor or comparable product by one of the following:
 - 1). Heckmann Building Products
 - 2). Wire-Bond
 - 3). Or approved equal
2. For block walls forming part of exterior wall construction, provide super heavy duty reinforcing fabricated of 3/16" dia. side and cross rods, truss or ladder design, ties, spaced every block course. Provide prefabricated pieces at corners and intersections of walls or partitions.



- a. Provide reinforcing assembly with hot dip galvanized steel finish conforming to ASTM A 153 with zinc coating of 1.5 oz. of zinc per sq. ft., after fabrication.
3. For interior block walls and partitions, provide standard reinforcing fabricated of 9 ga. side and cross rods, truss or ladder design, no ties, spaced every other block course. Provide prefabricated pieces at corners and intersections of walls or partitions. Provide reinforcing with mill galvanized finish conforming to ASTM A 641, Class B-1, applied after fabrication.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1). Hohmann & Barnard
 - 2). Heckmann Building Products
 - 3). Wire-Bond
 - 4). Or approved equal
4. Wire used in assemblies noted above: Cold drawn steel wire conforming to ASTM A 82.

D. Anchors and Ties

1. For anchoring brick to cold formed metal framing, provide hot dip galvanized anchors. Ensure brick tie length matches or exceeds exterior insulation depth so that insulation does not need to be cut out at pindle locations.
 - a. Subject to compliance with requirements, products that may be incorporated into the Work include the following:
 - 1). Heckmann Building Products; Wing-Nut Pos-I-Tie with self-drilling screw for steel studs zinc barrel and thermal wing-nut, and Seismic Wire Pindle Tie hot-dip galvanized steel.
 - 2). Hohman & Barnard; X-Seal Veneer Anchor hot-dip galvanized steel anchors with X-Seal Tape and Model 187 Seismicclip with 9 ga. wire.
 - 3). Wire Bond.
 - 4). Or approved equal.
2. Dovetail Anchor Slots: Hot-dip galvanized steel, 16 gauge equal.
 - a. Product: Subject to compliance with requirements, provide one of the following:
 - 1). Heckmann Building Products; No. 100 Dovetail Anchor Slot
 - 2). Hohmann & Barnard; No. 305 anchor slot
 - 3). Wire-Bond; Dovetail Slot 1304
 - 4). Or approved equal.
3. Flexible Metal Ties for Dovetail Slots: Hot-dip galvanized, 16 gauge by 1" wide corrugated anchors and dovetail triangle ties.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1). Hohmann & Barnard
 - 2). Heckmann Building Products
 - 3). Wire-Bond
 - 4). Or approved equal



4. Wire Mesh: Hot-dip galvanized sixteen (16) gauge steel wire, square mesh, width 3" by length to suit condition.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Heckmann Building Products; No. 268 or comparable product by one of the following:
 - 1). Hohmann & Barnard
 - 2). Wire-Bond
 - 3). Or approved equal.
5. For anchoring face brick to concrete back-up where there are no dovetail slots provided, provide veneer anchoring system.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Heckmann Building Products; CMU/Concrete Screw Wing-Nut Pos-I-Tie, with five (5) gauge hot-dip galvanized (ASTM A 153, Class B-2) wire pintle tie, or comparable product by one of the following:
 - 1). Hohmann & Barnard
 - 2). Wire-Bond
 - 3). Or approved equal.
6. For anchoring CMU wall, at the exterior masonry cavity wall, to the underside of the concrete beam, provide dovetail slot as noted above and the following:
 - a. Steel dowel anchor, galvanized to conform to ASTM A 153, Class B-2.
 - b. Product: Subject to compliance with requirements, provide one of the following:
 - 1). Heckmann Building Products; No. 121 galvanized steel dowel anchor and No. 421 tube.
 - 2). Hohmann & Barnard; No. PTA-310 galvanized steel dowel anchor and No. NS-TA joint filler.
 - 3). Wire-Bond; PTA No. 4300 with PTA tube
 - 4). Or approved equal.
7. For anchoring masonry to structural steel, provide hot-dip galvanized steel anchors. Galvanizing: Conform to ASTM A 153, with zinc coating of 1.5 oz. of zinc per sq. ft.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1). Hohmann & Barnard
 - 2). Heckmann Building Products
 - 3). Wire-Bond
 - 4). Or approved equal
8. For anchoring CMU interior partitions to underside of steel beams, provide hot dip galvanized steel partition top anchors.
 - a. Product: Subject to compliance with requirements, provide one of the following:
 - 1). Heckmann Building Products; No. 419 and No. 421
 - 2). Hohmann & Barnard; No. PTA 420
 - 3). Wire-Bond; PTA #4301
 - 4). Or approved equal.



9. For anchoring CMU interior partitions to underside of structural deck, provide 4" x 4" x 1/4" galvanized steel angles (ASTM A 36), 3'-0" long spaced 3'-0" o.c. alternately on each side of partition. Anchor partition securely to structural deck.
- E. Reinforcing Bars and Rods: ASTM A 615, Grade 60. See Drawings for size.
- F. Control and Expansion Joint Fillers
 1. Vertical Installation Within Concrete Masonry Wall: Extruded high grade neoprene rubber, cross shape, for use with concrete masonry sash units, force fit in the grooves of the sash block, with 1/2" diameter tubular ends (compressed 25% when installed in 3/8" wide joint).
 - a. Provide the following sizes:
 - 1). 2-5/8" wide control joint fillers for 4" block walls.
 - 2). 4-5/8" wide for 6" block walls.
 - 3). 6-5/8" wide for 8", 10" and 12" block walls.
 - b. Provide backer rod and sealant joint over joint filler as per drawings and Section 07 92 00 "Joint Sealants."
 2. Isolation Joint Filler at Abutting Construction and at Intersecting CMU Walls: Compressible and resilient closed cell neoprene gasket with pressure sensitive adhesive backing, thickness 30% greater than thickness of joint. Recess joint filler and install backer rod and sealant as per drawings and Section 07 92 00 "Joint Sealants."
 3. Within Face Brick: Provide filler rod and sealant installed by Section 07 92 00 "Joint Sealants."
 - a. Filler depth: 2 times joint width.
 - b. Compressible filler between top of brick and bottom of shelf angle or steel lintel: "Soft Joint Sealant" made by Polytite, or equal by BASF Construction Chemicals - Building Systems, Construction Foam Products, a division of Nomaco, Inc. or approved equal.
 4. Within Expansion Joint at Face Brick: Manufacturer's standard preformed, pre-compressed, open-cell polyurethane foam sealant impregnated with a water based, non-drying polymer modified acrylic water repellent.
 - a. Properties: Permanently elastic, mildew resistant, non-migratory, non-staining, and compatible with joint substrates and other joint sealants. Density: 8.4 to 9.1 lb./cu. ft.
 - b. Basis-of-Design Product: Subject to compliance with requirements, provide Emseal; Seismic Colorseal or comparable product by one of the following:
 - 1). Schul International Co.
 - 2). Watson Bowman Acme Corp.
 - 3). Or approved equal.
- G. Neoprene Joint Filler: Provide closed cell neoprene, Type NN-1, conforming to ASTM D 1056, Grade 1, high performance
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Williams Products Inc.
 - b. D. S. Brown
 - c. Norton



- d. Or approved equal.

2.3 MORTAR MATERIALS

- A. Portland Cement: ASTM C 150, Type 1, standard color, one source.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Aggregate: Clean, washed, buff colored sand, graded per ASTM C 144.
- D. Aggregate for Grout: ASTM C 404.
- E. Water: Clean, fresh and suitable for drinking.

2.4 MORTAR AND GROUT MIXES

- A. Exterior Face Brick Construction: Provide mortar mixes meeting ASTM C 270, Type N, cement/lime mortar. For colors of mortars, use coloring agent made by Davis Colors, Lehigh Cement, Solomon Colors, Inc. or approved equal. Color of mortar to meet with Commissioner's approval. The Contractor may use pre-packaged colored mortar equal to "Color Mortar Blend" by Glen-Gery, or equal by Davis Colors, Lehigh Cement or approved equal.
 - 1. Color of mortar must meet with Commissioner's approved sample and mock-up panel.
- B. Exterior Block Back-Up Construction: Provide Portland cement/lime mortar as noted above conforming to ASTM C 270, Type N.
- C. Interior Masonry Construction: Provide Portland cement/lime mortar conforming to ASTM C 270, Type N, for load bearing conditions, provide mortar conforming to ASTM C 270, Type M.
- D. Reinforced Concrete Block: Provide Portland cement/lime mortar conforming to ASTM C 270, Type S.
- E. Mortar for Cement Cants: One (1) part Portland cement and four (4) parts sand, by volume.
- F. Grout for Unit Masonry: Comply with ASTM C 476 for grout for use in construction of unit masonry. Use grout of consistency (fine or coarse) at time of placement which will completely fill all spaces intended to receive grout. Provide grout with a minimum compressive strength of 3000 psi when tested in accordance with ASTM C 1019.
- G. Mixing
 - 1. General: Add cement just before mixing and mix dry. Use sufficient amount of water as necessary to produce workable mix. Mix in small batches to make plastic mass.
 - 2. Mixing: Machine mix all mortars in approved type mixer with device to accurately and uniformly control water. Add hydrated lime dry. Mix dry materials not less than two (2) minutes. Add water, then mix not less than three (3) minutes, not to exceed five (5) minutes. Mix only amount of mortar that can be used before initial set. Do not use mortar which has reached its initial set or two (2) hours after initial mixing, whichever comes earlier. Mortar may not be re-tempered. Clean mixer for each batch, whenever mortar type is changed, and at end of each day's work.
 - 3. Acceleration or other admixtures not permitted.



4. Provide mortar with a flow after suction of not less than seventy-five (75) percent of that immediately after mixing as determined by ASTM C 91.

H. Admixtures

1. Do not use air-entraining admixtures or cementitious materials containing air-entraining admixtures in the mortar.
2. Do not use antifreeze compounds or other substances in the mortar to lower the freezing point.
3. Do not use calcium chloride or admixtures containing calcium chloride in mortar.

2.5 MASONRY ACCESSORIES

- A. Neoprene Joint Filler: Provide closed cell neoprene, Type NN-1, conforming to ASTM D 1056, Grade 1, high performance

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Williams Products Inc.
 - b. D. S. Brown
 - c. Norton
 - d. Or approved equal.

- B. Weep Holes: Provide clear plastic weep holes 3/8" wide and 1-1/2" high by four (4) inches long.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Hohmann & Barnard; No. 342 or comparable product by one of the following:
 - a. Heckmann Building Products
 - b. Wire-Bond
 - c. Or approved equal.

- C. Through-Wall Flashing: Provide sheet membrane flashing as part of exterior wall membrane system. Provide sealants and tapes as recommended by the manufacturer. Provide preformed corner sections "end dams" with system when flashing is discontinuous.

1. Provide flashing for surface adhered applications at sheathed areas with 26 ga. stainless steel termination bar.
2. Provide wall flashing with 26 ga. stainless steel drip edge adhered to edge of flashing; set drip edge in sealant as specified in Section 07 92 00 "Joint Sealants."

- D. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.

1. Configuration: Strips, full depth of cavity and 10 inches high, with dovetail-shaped notches 7 inches deep that prevent clogging with mortar droppings.
2. Basis-of-Design Product: Subject to compliance with requirements, provide Hohmann & Barnard, Inc.; Mortar Net or comparable product by one of the following:
 - a. Advanced Building Products



- b. Mortar Net Solutions
- c. Or approved equal.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

- A. Brick

- 1. Wet brick having an initial rate of absorption greater than 30 grams per 30 square inches when tested per ASTM C67. Wet bricks by allowing water to run on the cubes or pallets of brick, or placing them in a large tank of water.
 - 2. Except for absorbent units specified to be wetted, lay masonry units dry.

- B. Concrete Block: Do not wet concrete block units.

3.3 INSTALLATION

- A. General

- 1. Build walls to the full thickness shown. Build single wythe walls to the actual thickness of the masonry units, using units of nominal thickness shown.
 - 2. Build chases and recesses as shown or required for the work of other trades.
 - 3. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.
 - 4. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to properly locate openings, movement type joints, returns and off-sets. Avoid the use of less than half size units at corners, jambs and wherever possible.
 - 5. Lay up walls plumb and true with courses level, accurately spaced and coordinated with other work.
 - 6. Provide templates made of steel studs for plumbing of two story masonry openings.
 - 7. Pattern Bond: Lay exposed masonry patterns as noted on drawings. If not shown, provide running bond. Lay concealed concrete block with all units in a wythe bonded by lapping not less than two (2) inches. Bond and interlock each course of each wythe at corners. Do not use units of less than four (4) inches horizontal face dimensions at corners or jambs.
 - 8. Where possible, build masonry walls and partitions after all overhead ducts, pipes and conduits are in place and tested. Neatly build masonry around the items above. Construct walls and partitions plumb, true to line and free from defects such as open cells, voids, dry joints and other similar defects. In rooms and spaces scheduled to have concrete block finish, make all such surfaces including upper wall surfaces up to termination of structural ceiling in spaces without suspended ceilings, suitable for paint application. Cut openings in walls and partitions in place only with the approval of the Commissioner.



9. Do not use any brick that do not meet chippage and tolerances of the applicable ASTM standard noted herein for the grade, type or class of brick.
10. Mortar, ties and reinforcement must not extend into or bridge any expansion joints.

B. Mortar Bedding and Jointing

1. Completely fill all joints between bricks with mortar. Bevel bed joints per BMI recommendations, with the brick then shoved in place. At cavity wall construction, take care that no excess mortar goes into masonry cavity. Completely fill head joints with mortar and form by applying a full coat of mortar to the entire end or the entire side, as the case requires, and then shoving the mortar covered end and/or side of the brick tightly against the bricks previously laid; the practice of "slushing" by throwing mortar into the head joints will not be permitted. Lay all brick without disturbing the brick previously laid. Lay brick within a minute or so after the mortar is placed. Dry or butt joints will not be permitted. Grout only as necessary. Do not slush head joints.
2. After brick placement, cut off mortar squeezed out of bed joints before tooling.
3. Lay concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on exterior walls and in all courses of piers, columns and pilasters, where solid CMU is used and where adjacent to cells or cavities to be reinforced or filled with concrete or grout.
 - a. To ensure alignment of brick and block coursing, adjust block back-up by cutting block to ensure alignment of coursing or use adjustable anchorage.
4. Lay masonry walls with 3/8" joints unless otherwise shown on drawings.
5. Tool exposed joints slightly concave after the mortar joint is "thumbprint" hard. Strike concealed joints flush, including at any CMU schedule to receive a waterproofing or air barrier membrane.
6. Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners at jambs to fit stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

C. Stopping and Resuming Work: Rake back 1/2 brick length in each course; do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry.

D. Built-In Work

1. As the work progresses, build in items specified under this and other Sections of these specifications. Fill in solidly with masonry around built-in items.
2. Mortar in door frames, access doors, louvers and other metal items embedded or built into masonry work solidly with mortar as the masonry units are laid up.
3. Grout under lintels, bearing plates, and steel bearing on masonry with solid bed grout.
4. Seal sleeves, pipes, ducts and all other items which pass through masonry walls with interior grade sealant meeting requirements of Section 07 92 00 "Joint Sealants", so as to be air tight and prevent air leakage. Refer to Section 07 84 00 "Firestopping" for packing of voids in rated masonry walls.



5. Fill vertical cells of masonry units solid with grout which have anchoring, reinforcing rods, supporting or hanging devices embedded in the cell including stone anchors and window or curtain wall anchors.
6. Fill vertical cells of masonry units solid with mortar on each side of door frames to sixteen (16) inches beyond.
7. Unless otherwise noted, fill vertical cells of masonry units solid with grout which are below steel bearing plates, steel beams, and ends of lintels, to eight (8) inches beyond bearing and from floor to bearing.
8. Place wire mesh in horizontal joint below masonry unit cells to be filled with mortar, to prevent mortar from dropping into unfilled cells below.
9. Fill all voids in masonry indicated as being reinforced solid with grout. Consolidate grout in place by vibration or other methods which ensure complete filling of cells. When the least clear dimension of the grouted cell is less than two (2) inches, the maximum height of grout pour may not exceed twelve (12) inches. When the least clear dimension is two (2) inches or more, maximum height of grout pour may not exceed forty-eight (48) inches. When grouting is stopped for one (1) hour or longer, stop the grout pour 1-1/2" below the top of a masonry unit. Accurately place vertical bar reinforcing and hold in position while being grouted; reinforcing must be in place before grouting starts. Install all such reinforcing with a minimum clear cover of 5/8". Lap all bars a minimum of forty (40) bar diameters and provide steel spacer ties (not to exceed 192 bar diameter) to secure and position all vertical steel and prevent displacement during grouting. Provide continuous horizontal reinforcement embedded in mortar joints every second course.

E. Cutting and Patching

1. All exposed masonry which requires cutting or fitting must be cut accurately to size with motorized carborundum or diamond saw, producing cut edges.
2. Do not saw cut any masonry openings in face brick construction without Commissioner's approval and after a procedure has been reviewed and approved.
3. Neatly drill to proper size holes made in exposed masonry units for attachment of handrail brackets and similar items.
4. All masonry which requires patching in exposed work, if approved by Commissioner, must be patched neatly with mortar to match appearance of masonry as closely as possible and to the Commissioner's satisfaction. Rake back joints and use pointing mortar to match as required.

F. Solid Wall Construction

1. Fill the vertical longitudinal joint between wythes solidly with mortar by parging the in-place wythe and shoving units into the parging.
2. Tie wythes with continuous horizontal reinforcement embedded in mortar joints sixteen (16) inches o.c. vertically.

G. Cavity Walls

1. For all exterior masonry walls, unless otherwise indicated, provide cavity walls of thickness indicated.



2. Securely tie two wythes of masonry cavity walls together by horizontal joint reinforcement and ties anchored to reinforcement, as herein specified, spaced every other block course.
 - a. Where cavity back-up is concrete use ties specified herein spaced sixteen (16) inches o.c. both directions.
3. Keep cavity between facing and backing wythe clean and clear of all mortar droppings, and with no mortar ledges projecting into the cavity. Lay temporary wood strips, cut to width of cavity and fitted with lift-up wires, on the joint reinforcement and carefully lift out before placement of the next layer of reinforcement. Spread any projecting mortar over the back of the outer wythe immediately following the setting of the masonry unit.
 - a. Install mortar net at the bottom of each cavity over the flashing to protect weep holes.
4. At cavity and solid walls adjacent to window openings fill block solid with mortar where window anchors are to be located. Coordinate with window subcontractor.
5. Anchor concrete block back-up at cavity wall construction to slab at top with dovetail anchors spaced sixteen (16) inches o.c.
6. Anchor CMU back-up with anchors as specified herein.
7. Refer to Section 07 21 00 "Thermal Insulation" for material and installation of cavity wall insulation.

H. Interior Block Partitions

1. Build to full height unless otherwise shown on drawings. At non-rated partitions, fill void between CMU and structural deck with continuous neoprene filler conforming to the requirements of Article 2.2 herein. At fire rated partitions, fill void with fire stop material meeting the requirements of Section 07 84 00, Firestopping. Fasten to structure at top of partition using steel angles as specified herein.
2. Provide continuous horizontal joint reinforcing every other block course, except as otherwise noted. Fully embed longitudinal side rods in mortar for their entire length with a minimum cover of 5/8". Lap reinforcement a minimum of six (6) inches at ends of units.
3. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions.
4. Corners
 - a. Provide interlocking masonry unit bond in each course at corners.
 - b. Provide continuity at corners with prefabricated "L" reinforcement units, in addition to masonry bonding.
5. Intersecting and Abutting Walls
 - a. Unless vertical control joints are shown as part of structural frame, provide interlocking masonry bond. Provide starters and special shapes as shown on the drawings to bond these walls.
 - b. In addition to masonry bonding, provide horizontal reinforcement using prefabricated "T" units at interior partitions.



I. Ties and Anchors for Masonry Construction

1. Provide ties and anchors as shown or specified, but not less than one metal tie, spaced not to exceed sixteen (16) inches o.c. horizontally and/or vertically. Provide additional ties within 1'-0" of all openings and adjacent to expansion joints and spaced not more than 16" apart around perimeter of openings.
2. Anchor masonry to structure complying with the following:
 - a. Provide an open space not less than 1/2" in width between masonry and structural member, unless otherwise shown. Keep open space free of mortar or other rigid materials.
3. Attach brick veneer to cold formed metal framing by anchoring brick to studs using specified anchors penetrating through sheathing and through flange of stud. Prior to application of anchors cover sheathing and vapor barrier with tape specified herein. Space anchors 8" o.c. at each stud; provide stainless steel screw anchors for attaching anchor to studs.

J. Control and Expansion Joints

1. Provide expansion, control and isolation joints in masonry as shown. Build in related items as the masonry work progresses.
2. CMU Control Joint Spacing: If location of control joints is not shown, place vertical joints spaced not to exceed 25'-0" o.c. In addition, locate joints at points of natural weakness in the masonry work, including the following:
 - a. At structural column or joint between bay.
 - b. Above control joints in the supporting structure.
 - c. Above major openings at end of lintels upward and below at ends of sills downward. Place at one side of jamb for openings less than 6'-0" wide and at both sides for openings over 6'-0" wide.
 - d. At reduction of wall thickness.
 - e. Where masonry abuts supporting structure.
 - f. If additional joints are required, indicate same on approved shop drawings.
3. Brick Veneer Expansion Joint Spacing: Locate vertical expansion joints in brick veneer construction maximum 20'-0" o.c. unless otherwise noted in addition to expansion joints located within 2'-0" of each corner of the building.

K. Lintels

1. Install loose steel lintels furnished by Section 05 50 00 Metal Fabrications, allowing eight (8) inch bearing at ends.
2. For concrete block walls, use specially formed U-shaped concrete block lintel units with reinforcing bars in accordance with the following table, filled with grout.
 - a. Number and Size of Reinforcing Bars Required at Concrete Block Lintels

1).	Maximum Clearance Span	Wall Width	Rebar (No. - Size)
(a).	2'-0" to 6'-0"	6"	2 - #3
(b).	6'-0" to 8'-0"	6"	2 - #4
(c).	2'-0" to 6'-0"	8"	2 - #3
(d).	6'-0" to 8'-0"	8"	2 - #4



(e).	2'-0" to 6'-0"	12"	3 - #3
(f).	6'-0" to 8'-0"	12"	3 - #4

3. Extend u-shaped concrete block lintels a minimum of 8" at each side of opening.

3.4 FLASHING/WEEP HOLES

- A. General: Install embedded flashing and weep holes in masonry at relieving angles, shelf angles, lintels, ledges, other obstructions to the downward flow of water in the wall, and where indicated. Space weeps 16" o.c. unless otherwise shown on drawings. Install weeps immediately above the flashing.
- B. Prepare masonry surfaces so that they are smooth and free from projections that could puncture flashing.
- C. Place flashing, generally, at bottoms of cavity wall construction, over all wall openings, window jambs, at sills of window, and in other locations where indicated on the drawings. Overlap flashing a minimum of 6". At bottoms of cavity walls, build the flashing extending from the exterior face of the brick, up and into the mortar joint 2" at the inner wythe of the CMU back-up; at sheathed areas attached with pressure bar. At concrete spandrel beams and columns install the flashing with a termination bar. Exercise extreme care in placing the masonry materials not to damage the flashing. Restore or replace flashing damaged during the masonry erection. Terminate discontinuous flashing with an end dam in a head joint, rising at least 1".
- D. When spanning an air space, support flashing with a mortar wash, insulation or treated wood blocking.
- E. Where flashing is penetrated by anchors, patch flashings at penetration using adhesive and mastic recommended by the manufacturer to ensure watertight seal.
- F. Install flashing in accordance with manufacturer's instructions, using adhesive, primer, thinner, cleaner and mastic as recommended by flashing manufacturer.
 1. Flashing must overlap adjacent piece of flashing a minimum of 6".
- G. Provide drip edge when flashing extends beyond face of brick.

3.5 CANTS

- A. Provide specified mortar for cement cants at beams and other projections in elevator shafts, where adjoining wall is of masonry construction. Slope cants twenty (20) degrees from the horizontal.

3.6 CLEANING, PROTECTION, ADJUSTMENT

- A. Protection: Take adequate precautions for the protection of all surfaces against mortar spatter and immediately remove any such spatter should it inadvertently occur, leaving no stain or discoloration.
 1. Wipe excess mortar off the masonry surfaces as the work progresses.
 2. Place wood coverings over all such masonry surfaces that are likely to be damaged during the progress of the entire project.
- B. Cleaning of Masonry: Upon completion, thoroughly clean all exposed masonry following recommendations of the BIA Technical Note No. 20. Before applying any cleaning agent to the entire wall, apply it to a sample wall area of approximately 4' x 4' in a location approved by the Commissioner. No further cleaning work may proceed until the sample area has been approved by the Commissioner, after which time the same cleaning materials and method must be used on the remaining wall area. If stiff brushes and water do not



suffice, thoroughly saturate the surface with clear water and then scrub with a solution of an approved detergent masonry cleaner, equal to "Vana Trol" made by ProSoCo Inc. or equal made by Diedrich, EaCo Chem, Inc. or approved equal, mixed as per manufacturer's directions, followed immediately by a thorough rinsing with clear water. Protect all lintels and other corrodible parts during cleaning.

1. Unless otherwise required by cleaning agent manufacturer use only low pressure device (30 to 50 psi) for application of cleaning agent and water rinsing.

C. Pointing: Point any defective joint with mortar identical with that specified for that joint.

END OF SECTION 04 20 00



THIS PAGE INTENTIONALLY LEFT BLANK



SECTION 04 72 00 - CAST STONE 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. Cast stone sills and base courses on building façade.
 - 2. Mortar.
 - 3. Anchors and accessories.
 - 4. Joint filler.

- B. Related Sections

- 1. Section 04 20 00 "Unit Masonry"
 - 2. Section 07 92 00 "Joint Sealants"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Submit samples of cast stone with documented independent testing laboratory reports.
- C. Samples: Before any cast stone materials are delivered to the job site, submit twelve (12) inch long samples of each profile type cast stone unit required.
 - 1. Submit 6" x 6" cast stone samples showing full range of colors and texture available.
- D. Shop Drawings: Submit complete shop drawings of all cast stonework showing anchorage, type, location and spacing, joint fillers, mortar, and cast stone profiles, sizes, connections, location, type and size of reinforcing and adjacent construction.
 - 1. The shop drawings shall show the setting mark of each stone and its location on the structure. The stone when delivered shall bear the same corresponding setting mark on an unexposed surface.
 - 2. Shop drawings must show exact profiles for each piece.
- E. Certification: Submit certification from an independent testing laboratory certifying to test results required under Article 1.4, Para. F. herein.



1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Qualifications of Workmen
 - 1. For the actual cutting and placing of cast stone units, use only skilled journeyman masons who are thoroughly experienced with the materials and methods specified and thoroughly familiar with the design requirements.
 - 2. In acceptance or rejection of installed cast stone units, no allowance will be made for lack of skill on the part of workmen.
- C. Manufacturer shall have a minimum of three (3) years' experience in the manufacture of cast stone. Manufacturer's products must have previously been used on the exterior with satisfactory results.
- D. Casting Tolerances: Maintain casting, bowing, warping and dimension tolerance within the following maximums:
 - 1. Overall Dimension for Height and Width of Units: Plus zero of unit dimension to minus 3/32" for 10'-0" and over.
 - 2. Twist, Bowing or Warping: Do not exceed length/360 or 1/8", whichever is greater.
 - 3. Insert Locations: Place within plus or minus 1/8" in each direction.
 - 4. Length of units shall not deviate by more than +/- 1/8" from approved dimensions.
- E. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
 - 1. ASTM C1364 Standard Specification for Architectural Cast Stone, except where more stringent standards are specified herein.
 - 2. ASTM C150 Specification for Portland Cement
 - 3. ASTM C33 Specification for Concrete Aggregates
 - 4. ASTM C979 Specification for Coloring Pigments for Integrally Pigmented Concrete
 - 5. ASTM C494 Specification for Concrete Admixtures
 - 6. ASTM A615 Specification for Deformed and Plain Billet Steel Bars for Concrete Reinforcement
 - 7. ASTM C1194 Test Method for Compressive Strength of Architectural Cast Stone
 - 8. ASTM C1195 Test Method for Absorption of Architectural Cast Stone
 - 9. ASTM C642 Test Method for Specific Gravity, Absorption, and Voids in Hardened Concrete
 - 10. ASTM C39 Test Method for Compressive Strength of Concrete Cylinders.



11. ASTM D2244 Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.

- F. Testing: Test three specimens per 500 cubic feet at random from plant production in accordance with referenced standards.
- G. Cold weather setting practices shall conform to the requirements specified in Section 04 20 00 "Unit Masonry."

1.5 MOCK-UP

- A. Provide full size unit(s) for use in construction of wall mock-up specified in Section 04 20 00 "Unit Masonry." The mock-up becomes the standard of workmanship for the project.

1.6 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect cast stone and related materials before, during, and after installation, and to protect the installed work and materials of all other trades.
 - 1. Stone shall be stored on skids off the ground and covered with plastic sheeting; all material in contact with stone shall be non-staining.

PART 2 PRODUCTS

2.1 CAST STONE COLOR AND FINISH

- A. Cast Stone used in this work shall match color and texture of samples approved by the Commissioner.
- B. Exposed surfaces, unless otherwise specified, shall exhibit a typically fine-grained texture similar to natural stone. No bug holes will be permitted and all facing material shall be mixed in a muller mixer.

2.2 MANUFACTURER

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Reading Rock, Inc.; RockCast Window Sill SL-490 and Base Course Face FC-500, in Buffstone color, or comparable product by one of the following:
 - 1. Dura Art Stone Co.
 - 2. Continental Cast Stone Mfg. Inc.
 - 3. Or approved equal.
- B. Cast Stone used in this work shall conform to the following properties:
 - 1. Compressive Strength, ASTM C1194: 6500 psi min. for products at 28 days.
 - 2. Absorption, ASTM C1195 or ASTM C642: 6% max. for products at 28 days.
 - 3. Cumulative Percent Weight Loss (CPWL) shall be less than 5% after 300 freeze/thaw cycles when tested in accordance with ASTM C1364.



4. Air Content: ASTM C173 or C231, for wet cast product only shall be 4-8%. Air entrainment is not required for dry cast products.
5. Linear Shrinkage - ASTM C426: Shrinkage shall not exceed 0.065%.
6. Color Variation
 - a. Must match color and finish of approved sample when viewed in direct daylight at a 5-foot distance.
 - b. ASTM Color Variation Allowed: 2% hue; 6% lightness, chrome and hue combined.

2.3 MATERIALS

- A. Cement shall be Portland Type I white, meeting ASTM C150.
- B. Fine aggregate shall be carefully graded and washed natural sands, or manufactured granite, marble, quartz or limestone sands meeting ASTM C33, except that gradation may vary to achieve desired finish and texture.
- C. Coarse aggregate shall be carefully graded and washed natural gravel, or crushed graded stone such as granite, marble quartz, limestone or other durable stone meeting ASTM C33, except that gradation may vary to achieve desired finish and texture.
- D. Coloring: All colors added shall be inorganic (natural or synthetic) iron oxide pigments meeting ASTM C979 excluding the use of a cement grade of carbon black pigment, and shall be guaranteed by the manufacturer to be light fast and lime proof. The amount of pigment shall not exceed ten (10) percent by weight of the cement used.
- E. Cast stone shall be reinforced with new billet steel reinforcing bars meeting ASTM A615, grade 60, when necessary for safe handling, setting and structural stress, and the size of the reinforcing shall be as shown on approved shop drawings. If the surfaces are to be exposed to the weather, the reinforcement shall be galvanized or epoxy coated when covered with less than two (2) inches of material for bars larger than 5/8 inch and 1-1/2 inches for bars 5/8 inch or smaller. The material covering in all cases shall be at least twice the diameter of the bars. Stone shall be fully reinforced to take all stresses including handling, temperature changes and structural stress.
- F. All anchors, dowels and other anchoring devices shall be furnished by the stone setter as shown on approved shop drawings using building stone anchors fabricated of stainless steel Type 304.
 1. Anchors shall allow for wracking of the structure (seismic) without stressing the cast stone units.

2.4 FABRICATION

- A. Cast stone, after being made, shall be cured as noted below in Article 2.5.
- B. Cast stone shall be "dry cast" or "wet cast" (depending upon selected finish) to produce sharp arrises to match profiles on approved shop drawings. Provide stone with sinkages to receive anchors.
- C. Cast stone for copings shall be fabricated to largest practical length, as shown on approved shop drawings.



- D. Acid etch exposed surfaces as required to remove cement film prior to packaging and shipment. Sandblasting or chemical retardation finishing is not permitted.

2.5 CURING

- A. Cure units in a warm curing chamber approximately 100 deg. F. at 95% relative humidity for approximately 12 hours, or cure in a 95% moist environment at a minimum 70 deg. F. for 16 hours after casting. Additional yard curing at 95% relative humidity shall be 350 degree days (i.e. 7 days at 50 deg. F. or 5 days at 70 deg. F. prior to shipping. Form cured units shall be protected from moisture evaporation with curing blankets or curing compounds after casting.

2.6 ACCESSORIES

- A. Mortar for setting of cast stone sections shall conform to ASTM C270, Type N, with not more than 1/2 part lime per part of white non-staining Portland cement.
- B. Joint Filler: Fill all joints with exposed tops with "Emseal Backerseal" Expanding Foam Sealant as manufactured by Emseal, Inc., Wilseal, Schul International or approved equal. Material shall be designed for compression in joint twenty-five (25) percent of its original width, depth of filler as per manufacturer's standard. Joint filler shall be recessed 3/4" from finished surface.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. Carefully coordinate with all other trades to ensure proper and adequate interface of the work of other trades with the work of this Section.

3.3 JOINTING

- A. Joint Size: 3/8", unless otherwise noted.
- B. Joint Material
 - 1. Use a full bed of mortar at all bed joints.
 - 2. Flush vertical joints full with mortar.
 - 3. Leave all joints with exposed tops open for sealant.
- C. Location of Joints: As shown on approved shop drawings.

3.4 SETTING

- A. Set all cast stone accurately and in accordance with the shop and setting drawings. Firmly place all anchors and dowels and completely fill all anchor holes, dowel holes and similar holes with mortar.



- B. Setting Tolerances: Plus/minus 1/32" allowable out of plane with adjacent units.
- C. When setting with mortar, drench all stones not thoroughly wet with clear water just prior to setting.
- D. Protect stone from splashing mortar or damage by other trades. Immediately remove foreign matter splashed on stone.
- E. Fill all joints with exposed tops with joint filler specified herein recessed 3/4" from stone surface; fill balance of joint with back-up rod and sealant in accordance with Section 07 92 00 "Joint Sealants."

3.5 PATCHING

- A. The repair of chipped or damaged cast stone shall be done only by mechanics skilled in this class of work, with materials furnished by the manufacturer and according to his direction.
- B. Patching will not be permitted on copings and any other piece which can be removed and replaced without undue difficulty. Replace such pieces which are chipped or damaged with identical new pieces. Reseal and/or repoint to remove any evidence of replacement.
- C. Cast stone shall show no obvious repairs or imperfections other than minimal color variations when viewed with the unaided eye under good typical lighting at a ten (10) foot distance.

3.6 CLEANING

- A. Before pointing, scrub the face of all cast stone with a fiber brush, using soap powder and water and then rinse thoroughly with clean running water. Remove mortar on the face of the cast stone. No acids or prepared cleaners shall be used without the approval of the cast stone manufacturer.

3.7 POINTING

- A. When ready for tuck pointing, the mortar joints shall be dampened and raked back 3/4" for pointing. Pointing shall form a slight concave profile. No pointing shall be done in freezing weather nor in locations exposed to hot sun unless properly protected. Pointing mortar shall be composed of one (1) part non-staining cement (ASTM C91), one (1) part hydrate lime (ASTM C207, Type S) and four (4) parts of clean, washed sand (ASTM C144). Coloring pigments shall be added as specified in Section 04 20 00 "Unit Masonry" for face brick construction. The Commissioner shall approve color of pointing mortar before proceeding with pointing.

END OF SECTION 04 72 00



SECTION 05 12 00 - STRUCTURAL STEEL FRAMING

PART I - GENERAL

1.1 RELATED DOCUMENT

- 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 but is not limited to the following as shown on the drawings and as specified herein:
1. Furnish and deliver for installation by others, anchor bolts, bearing plates and loose lintels with complete instructions and templates to facilitate installation.
 2. Furnish and erect all struts, columns, bearing plates, beams, steel trusses, girders, bracing, hangers and all related connections (bolted and welded).
 3. Openings (unreinforced and reinforced) in structural steel to accommodate mechanical and electrical work.
 4. Shop painting and field touch-up painting.
 5. Erection bracing and supports, including steel wedges, shims or nuts required for leveling base plates.
 6. Lintels and angles attached to structural steel as shown on drawings.
 7. Unless specifically excluded, furnish and install all other items for structural steel work indicated on the drawings, specified, or obviously needed to make the work of this Section complete.
 8. Waste Management
- B. Related Sections:
1. Division 03 Section "Cast in Place Concrete"
 2. Division 04 Section "Unit Masonry"
 3. Division 05 Section "Steel Decking"
 4. Division 05 Section "Metal Fabrications"
 5. Division 06 Section "Rough Carpentry"
 6. Division 07 Section "Self Adhering Membrane Waterproofing"
 7. Division 07 Section "Joint Sealants"
- C. Related Requirements:
1. Installation of anchor bolts furnished under this section.
 2. Grout under base and bearing plates.
 3. Installation of loose lintels furnished under this section.
 4. Miscellaneous metal work
 5. Light gage metal roof trusses.



6. Stair framing and hangers.
7. Field painting of structural steel, except as specified herein.
8. Fireproofing systems.

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: Submit data for each type of product indicated in the contract documents.
- C. Shop Drawings: Submit shop drawings in accordance with the specifications as follows:
 1. Show clearly all work, including relationship of structural steel to the adjacent work of other trades and to significant lines of finishes of other trades.
 2. Do not fabricate or deliver work to the site before drawings reviewed by the Commissioner have been returned.
 3. Before preparing steel shop drawings, submit proposed submittal schedule for review by the Commissioner.
 4. Before preparing steel shop drawings, submit for review a set of job standards showing all necessary joint details with full particulars of connection pieces, shop and field welds, and holes for erection bolts and permanent bolts. These must include any moment and shear connections. Appropriate marks for designating all types and sizes of joint details must be included. After approval of these job standards, the erection plans are to be submitted and must be marked to indicate unmistakably the type and size of joint to be used for every beam connection. Do not order steel in advance of approval of the job standards and the erection plans with joint marks, except at own risk
 5. Submit calculations for design of connections on job standards and all other connections such as moment and brace frames. Calculations must be signed and sealed by a Professional Engineer licensed in the state of New York.
 6. Prepare remainder of steel shop drawings after approval of job standards and erection plans. Drawings submitted prior to approval of job standards will be returned without review.
 7. Prepare shop drawings in conformance with the applicable procedures shown in "Detailing for Steel Construction," latest edition, published by AISC. Prepare shop drawings under the supervision of competent engineering personnel, licensed by the state in which the construction is to take place. During the preparation of shop drawings, and prior to submittal, coordinate and cross check all shop drawings, including those prepared by subcontractors, for compliance with the Contract Documents.
 8. Indicate clearly the size and grade of steel for each component. Identify rolled shapes, tubes and plates by using the standard designations used in "Steel Construction Manual" Latest Edition, by AISC.
 9. Indicate welds and nondestructive tests by using the symbols conforming to AWS A2.4 "Symbols for Welding and Nondestructive Testing." Where necessary for clarity, indicate welding procedure designations or other data in the tail of the welding symbol.
 10. Show explicitly the type of connection used in each location, including the grade, size, and number of bolts; the type, number, position, designation and orientation of each washer; and the size of each hole, whether slotted or round. Ensure that adequate wrench clearance for correct bolt tightening is provided and note special bolt tightening sequences where applicable and necessary.
 11. Show all camber dimensions in the shop drawings. Where specific camber is not shown in the drawings, note on each affected shop drawing that such members are to be fabricated with the natural camber up.



12. Show holes required for securing work specified in other sections to structural steelwork, as well as all holes required for passage through structural steelwork of work of other trades. Provide field work drawings for all such holes not shown in shop or erection drawings. Addition of, or change in size or location of openings will not be permitted without prior approval.
 13. Use bolted connections wherever possible; avoid field welding unless otherwise noted on drawings.
 14. Make details in such a way as to avoid having steel, connections, bracing, bolts, etc., interfere with architectural details or in any way reduce the areas of shafts, openings, clearances, etc.
 15. Detail and schedule cleaning and painting data and requirements, including specific indication of "no paint" areas.
 16. Show clearly the size and location of each member and the erection mark assigned to each member. Show each field connection with all data and details necessary for assembling the structure. Direct special attention to the possible need for special guying, bracing, or shoring to prevent deformation of existing or new structure due to stresses caused by erection procedures and equipment, by construction loadings, and by forces of natural phenomena.
 17. Prepare, keep up to date, and submit a complete drawing index cross referencing each assigned piece mark with the drawing number in which the piece is detailed. Detail drawings submitted without an up to date index and the applicable erection drawing(s) showing the location of each piece will be deemed an incomplete submission and will not be accepted as subject to any agreed shop drawing review schedule.
 18. Prepare anchor bolt and base plate erection drawings containing complete location and placing details, including details of all templates. Provide anchor bolt erection drawings to the concrete trade in advance of applicable concrete work and in coordination with concrete construction sequence.
 19. Submit, in writing, any proposed deviations from the Contract Documents, prior to the submission of shop drawings showing the proposed deviation. Submit requests for deviations on the steelwork subcontractor's letterhead. Deviations not identified, or identified only in letters of transmittal or in shop drawings or both, without the required written request, may not be accepted, and will be sufficient cause for the commissioner to return each shop drawing containing such deviations without further action. Acceptance of shop drawings containing deviations not detected by the Commissioner during shop drawing review will not relieve the steelwork subcontractor from responsibility to conform strictly to the Contract Documents.
 20. Prior to resubmission of shop drawings with additions or corrections, circle or bubble and identify all changes. Drawings submitted without each change being clearly identified are subject to return for resubmission.
 21. Prior to making shop drawings for any portion of the work involving alterations to an existing structure, make all necessary field observations, measurements and surveys of existing conditions. If probes are required to accomplish such measurements, give timely notice where probes will be required.
- D. Submit certified copies of each survey conducted by a surveyor licensed by the state in which the construction is to take place and employed by the structural steel subcontractor. Survey must show elevations and locations of base plates and anchor bolts to receive structural steel, and final elevations and locations for major members. Indicate discrepancies between actual installation and Contract Documents.
- E. Reports:
1. Submit certified copies of mill test reports for all steel furnished. Perform mechanical and chemical tests for all material regardless of thickness or use.
 2. Submit certification of recycled steel content. Certification must clearly indicate post-consumer AND post-industrial recycled steel content for the particular member or members used.



3. Submit anchor bolt checking certification as required.
 4. Submit qualification certificates of all welders who will perform work on the project.
 5. Submit survey of erected steelwork as required.
- F. Submit verification of bio-degradable or low VOC, and low Hazardous Air Pollutants (HAPS) cleaning solutions. Provide a cut sheet for all cleaning solutions used in the surface preparation of steel components. Highlight VOC limits and chemical component limits.

1.4 DEFINITIONS

- A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
- B. Seismic-Load-Resisting System: Elements of structural-steel frame designated as "SLRS" or along grid lines designated as "SLRS" on Drawings, including columns, beams, and braces and their connections.
- C. Heavy Sections: Rolled and built-up sections as follows:
1. Shapes included in ASTM A 6/A 6M with flanges thicker than 1-1/2 inches.
 2. Welded built-up members with plates thicker than 2 inches
 3. Column base plates thicker than 2 inches
- D. Protected Zone: Structural members or portions of structural members indicated as "Protected Zone" on Drawings. Connections of structural and nonstructural elements to protected zones are limited.
- E. Demand Critical Welds: Those welds, the failure of which would result in significant degradation of the strength and stiffness of the Seismic-Load-Resisting System and which are indicated as "Demand Critical" or "Seismic Critical" on Drawings.

1.5 PERFORMANCE REQUIREMENTS

- A. Connections: Provide details of all connections required by the drawings to be completed by structural steel fabricator (including comprehensive engineering analysis by a qualified professional engineer licensed in the State of New York) to withstand loads indicated and comply with other information and restrictions indicated, unless noted otherwise."
1. Select and complete connections using schematic details indicated and AISC 360.
 2. Use design method indicated on structural drawings.
 3. Moment Connections: Fully restrained unless otherwise noted on drawings.
- B. Lateral Framing Resisting System: Type used is indicated on structural drawings.

1.6 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".



- B. Except as modified by this specification, comply with the applicable provisions and recommendations of the following codes and standards:
1. New York City Building Code, 2014 Edition
 2. AISC "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings".
 3. AISC "Code of Standard Practice for Steel Buildings and Bridges" latest edition.
 4. AISC "Seismic Provisions for Structural Steel Buildings", latest edition.
 5. Industrial Fasteners Institute "Handbook of Bolt and Bolted Joints" latest edition.
 6. RCSC "Specifications for Structural Joints Using High-Strength Bolts."
 7. ASTM Standards as applicable in the New York City Building Code and as noted in this specification.
 8. AWS D1.1, "Structural Welding Code."
 9. AWS A5.18 & A5.28, Structural Welding Code for GMAW
 10. SSPC "Painting Manual, Volume 2, Systems and Specifications.", Latest edition. Use design method indicated on structural drawings.
- C. Qualifications for welding work will be as follows:
1. Qualify welding procedures and welding operators in accordance with the AWS "Standard Qualification Procedure."
 - a. Include amended requirements of the New York City Building Code as noted above.
 2. Submit certification that all welders to be employed in work are AWS qualified. If re-certification of welders is required, retesting will be responsibility of structural steel subcontractor.
 - a. Include licensing requirements as per the New York City Building Code.

1.7 TESTING AND INSPECTION

- A. Special Inspection as required by the New York City Building Code of all structural steelwork in the shop and field will be performed by an inspection agency retained by the City of New York. The inspection agency will work under the direction of the Commissioner. Contractor must provide the inspection agency with the following:
1. Schedule of all work in both shop and field with at least ten days' written notice before commencement of either activity.
 2. A complete set of approved shop and erection drawings.
 3. Cutting lists, order sheets, material bills, shipping bills and mill test reports.
 4. Information as to time and place of all rollings and shipment of material to shops.
 5. Representative sample pieces as requested by the testing agency.
 6. Full and ample means and assistance for testing all material.
 7. Proper facilities, including scaffolding, temporary work platforms, etc., for inspection of the work in the mills, shop and field.
- B. Each person installing connections must be assigned an identifying symbol or mark and all shop and field connections must be so identified so that the inspector can refer back to the person making the connection.



- C. The following minimum criteria must be adhered to in testing of welds and bolts:
1. All welds and bolts must be examined by visual means.
 2. 25% of all welds, selected randomly, must be measured.
 3. Bolted joints must be verified per the RCSC "Specification for Structural Joints Using High-Strength Bolts," Section 9, based on installation method.
 4. All welds subject to tensile stress must be examined by the Ultrasonic Method for 100% of their length.
 5. 10% of all manual fillet welds must be tested by the magnetic particle method.
 6. 1'-0" at each end of automatic fillet welds must be tested by the magnetic particle method.
 7. 100% of groove welds must be tested by the ultrasonic method.
- D. Shop inspection will include examination of steel for straightness and alignment, fissures, mill scale, and other defects and deformities, as described in ASTM A6, examination of fabricated pieces for conforming to approved shop drawings, testing of bolts and welds, and inspection of shop painting. All shop welds must be visually inspected and spot tested using Ultrasonic Method ASTM E 114 and AWS, Chapter 6, Part C. All inspected welds must be identified by the inspector.
- E. Field inspection will include examination of erected steel for welding, proper fitting and tensioning of bolts, alignment, trueness and plumbness, touching-up of shop coat, level of billets and base plates.
- F. Inspection of welding will be such as to assure that the work is within the quality requirements specified below and elsewhere in this section of the specifications and will include:
1. Ascertainment that the electrodes and flux used for the SAW, GMAW and FCAW welding processes conform to the requirements of this section of the specifications.
 2. Ascertainment that the approved welding procedures and sequence are followed without deviation, unless specific approval for change is obtained from the Commissioner.
 3. The testing agency must be prepared to utilize the following approved methods of testing:
 - a. Liquid penetrant inspection: ASTM E 165.
 - b. Magnetic particle: ASTM E 1444.
 - c. Radiographic inspection: ASTM E 94 and E 1032.
 - d. Ultrasonic inspection: ASTM E 114 and AWS, Chapter 6, Section C.
- G. When defects are revealed, additional inspection by whatever method is deemed necessary by the inspector must be performed to the extent necessary to assure that the full amount of defect has been located. No further work may be done on the assembly or sub-assembly in question until all the necessary corrections have been made. Defects must be repaired, using the same welding procedure that was used initially in making the weld, unless otherwise approved by the Commissioner. Inspection of the repaired weld must be by the same method that was used to reveal the defect. A second repair of a defective area may not be made without approval of the Commissioner.
- H. Apparatus and procedures for measuring required tension in pretensioned and slip-critical high strength bolted connections must be furnished and maintained by the steel contractor, in accordance with the RCSC "Specification for Structural Joints Using High-Strength Bolts," and must be approved by the inspection agency. The inspection agency must observe the pre-installation verification testing required and must ensure by routine observation that the bolted installations conform to the approved pre-tensioning method being used. The steel subcontractor must provide a laborer and scaffolding as required for the testing of



connections by the inspection agency, and must, at the subcontractor's own expense, furnish such facilities and provide such assistance as may be required for proper inspection.

- I. A distinguishing mark will be placed on all work that has been inspected and approved. Material or work that is not acceptable will be designated by words such as "REJECT" or "REPAIR" marked directly on the material or work.
- J. Inspection of Shop Painting:
 - 1. Visually evaluate surface preparation by comparison with pictorial standards in accordance with SSPC-Vis 1.
 - 2. Measure dry film thickness of each coat with a magnetic film thickness gauge in accordance with SSPC-PA 2.
 - 3. Visually inspect dried film for runs, sags, dry spray, overspray and missed areas.
 - 4. Repair defective or damaged areas in accordance with painting requirements specified. Architecturally exposed structural steel must be free of runs and holidays. Make repairs to shop or field coat as directed.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to site at such intervals to ensure uninterrupted progress of work. Minimize the disturbances to site and soil conditions.
- B. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete, in ample time not to delay work.
- C. Store materials to permit easy access for inspection and identification. Keep steel members in a safe, dry, off ground location, using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration, discoloration or staining.
- D. Do not store materials on structure in a manner that might cause distortion or damage to members of supporting structures. Repair or replace damaged materials or structures as directed.

1.9 PROJECT CONDITIONS

- A. The structural steel subcontractor must coordinate the structural steel work with the work of other trades. Verify all dimensions and details of this trade and those of other trades that affect the work before proceeding. Any discrepancies must be immediately reported to the Commissioner.
- B. Be fully responsible for the accurate installation of the work. Any discrepancy which arises from the subcontractor's failure to execute the work in conformity to the drawings and specifications must be properly remedied at the contractor's own expense and in a manner acceptable to the Commissioner.
- C. Locate dimensionally on setting plans all anchor bolts, inserts, bearing and base plates, etc., and prepare and deliver all required templates and fully dimensioned setting plans in time for the proper execution of the work. Anchor bolts will be set by another subcontractor. The structural steel contractor must check all such settings for correctness after they have been cast in place, and before proceeding with erection work.
- D. Report to the Commissioner and certify compliance with the above checking requirements in writing and indicate any inaccuracies found in the location of anchor bolts or inserts, and corrections which must be made to their installation. Any inaccuracies not included in the report and found during or after steel



erection will be the responsibility of the structural steel contractor and corrective measures will be borne by the structural steel contractor.

- E. Use base lines, bench marks, or other standards for survey work that have been provided or verified by others. If permanent building bench marks have been established, these will be used for field checking.
- F. Coordinate with all other trades to ensure that work of this section does not cause undue conflict. Ensure that location of erection devices such as cranes, derricks, booms or hoists, does not cause over-stresses to steel frame to work previously placed by other trades or to existing structures. When required, retain the services of a professional engineer licensed in the State of New York to ascertain that erection devices do not create unsafe conditions or cause overstresses.
- G. Ensure full co-ordination with other related trades and professions.

1.10 SUBSTITUTION

- A. The Commissioner reserves the right to require substitute shapes of other sizes than those indicated on the drawings when it is apparent that the shapes specified cannot be furnished within the time required for the progress of construction. Make said substitutions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel shapes, including structural steel wide flange and structural tee rolled shapes, channels, angles, plates, pipe, and hollow structural sections: As noted on structural drawings.
- B. High Strength Bolts: As noted on Structural Drawings.
- C. Anchor Rods: As noted on structural drawings
- D. Filler metal for welding electrodes. As noted on structural drawings.
- E. Structural steel primer paint: rust inhibitive primer conforms to the following criteria
 - 1. Coordinate all paint requirements with specification section 099000.
 - 2. Demonstrate a minimum of adhesion as classified by 4B of ASTM D 3359 method A
 - 3. Demonstrate a minimum opacity as determined by ASTM D 2805
 - 4. Demonstrate corrosion resistance per standards ASTM B 117 & ASTM D 5894
 - 5. "Slip Critical" compatible rating where applicable
 - 6. The product must not contain any of the prohibited compounds as listed in Green Seal *Standard for Paintings and Coatings*, GS-11, latest edition and in Master Painters Institute (MPI) *Green Performance Standard*, GPS-1-08.
 - 7. The product must meet the VOC limits as set forth in the MPI Green Performance Standard, GPS-1-08, with a maximum allowable VOC of 340 g/L for rust preventative coatings. Limits are expressed in THINNED state. Preference must be given to products with the least crystalline silica content.



8. The product must meet all the requirements of MPI Standards: 23, 26, 76, 79, 95, 107, 135, 173, 275. Products not listed with MPI are acceptable if and only if they meet the same environmental criteria for the same product category.
 - a. Exterior exposed steel, normal conditions: Use alkyd or polyamide solvent based paints (MPI #'s 76, 79 & 101)
 - b. Interior exposed steel: Use water based paint (MPI # 107)
 - c. Special Applications, highly corrosive environments: Use zinc rich paints (MPI #'s 20 & 200)
- F. Structural steel field paint for exposed members: rust inhibitive primer conforms to the following criteria
 1. Coordinate all paint requirements with specification section 099000.
 2. Demonstrate a minimum of adhesion as classified by 4B of ASTM D 3359 method A
 3. Demonstrate a minimum opacity as determined by ASTM D 2805
 4. Demonstrate corrosion resistance per standards ASTM B 117 & ASTM D 5894
 5. "Slip Critical" compatible rating where applicable.
 6. The product must not contain any of the prohibited compounds as listed in Green Seal *Standard for Paintings and Coatings*, GS-11, latest edition and in the Master Painters Institute *Green Performance Standard*, GPS-1-08.
 7. The product must meet the VOC limits as set forth in the MPI Green Performance Standard, GPS-1-08, with a maximum allowable VOC of 400 g/L for rust preventative coatings. Limits are expressed in THINNED state. Preference must be given to products with the least crystalline silica content.
 8. The product must meet all the requirements of MPI Standards: 23, 26, 76, 79, 95, 107, 135, 173, 275. Products not listed with MPI are acceptable if and only if they meet the same environmental criteria for the same product category. Products not listed with MPI are acceptable if and only if they meet the same environmental criteria for the same product category.
 - a. Exterior exposed steel, normal conditions: Use alkyd or polyamide solvent based paints (MPI #'s 23, 79)
 - b. Interior exposed steel: Use water based paint (MPI # 107)

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 FABRICATION

- A. All shop connections must be high strength bolted unless specifically shown otherwise. Fabricate work in shop in as large assemblies as practicable. Use welded connections ONLY where shown on drawings. If a bolted connection is not possible, obtain written approval from the Commissioner for the welded connection.
- B. Camber: As indicated on drawings.



- C. Mill column ends and bearing stiffeners to give full bearing over the cross section. Plane contact surfaces of bearing plates when required by the AISC Specifications. It is not necessary to plane bottom surfaces of plates on grout beds.
- D. Drill or punch holes at right angles to the surface of the metal, not more than 1/16" larger than the connector diameter. Do not make or enlarge holes by burning. Drill material having a thickness in excess of the connector diameter and material thicker than 7/8". Holes must be clean-cut without torn or ragged edges. Remove outside burrs resulting from drilling operations.
- E. Provide holes in members to permit connection of the work of other trades. Use suitable templates for proper location of these holes. Steel requiring adjustment or accurate alignment must be provided with slotted holes or full bearing shims as shown.
- F. Provide holes, slots and openings required by other trades together with necessary reinforcing required. Use suitable templates for proper location of these openings. All such openings must be shown on the shop drawings. No change in size or location will be permitted without prior approval.
- G. Manual flame cutting must be done only with a mechanically guided torch. An unguided torch may be used provided the cut is within 1/8" of the required line.

3.3 SHOP CONNECTIONS

- A. Provide connections as shown on the drawing exactly as detailed. Where connections are not detailed, the minimum connections must comply with appropriate tables headed, "Framed Beam Connections" shown in the AISC "Manual of Steel Construction" unless otherwise noted on the drawings. Use high strength bolts unless otherwise shown.
- B. Do not use welded connections unless shown on details. Field welding is not allowed without written instruction from the Commissioner.
- C. Proportion and detail all connections on shop drawings to resist forces shown on Contract Drawings.
- D. Bolting
 - 1. Bolts must be of a length that will extend not less than 1/4" beyond the nuts. Enter bolts into holes without damaging the thread.
 - 2. Joint Type: As noted on the Structural Drawings.
 - 3. Make high-strength bolted joints without the use of erection bolts. Bolt heads and nuts must rest squarely against the metal. Where structural members have sloping surface, bolted connections must be provided with beveled washers to afford square seating or framing for bolt heads or nuts.
 - 4. All joints are to be compacted to the snug-tight condition in accordance with Section 8 of the RCSC "Specification for Structural Joints Using High-Strength Bolts." Protect bolt heads and threads from damage during installation.
 - 5. Pretensioned and slip-critical joints are to be installed by one of the methods prescribed in Section 8.2 of the RCSC "Specification for Structural Joints Using High-Strength Bolts," unless written approval is obtained from the Commissioner.
 - 6. Bolts that have been completely tightened must be marked for identification.



E. Welding

1. The following environmentally preferable welding processes must be used as described for the related application without exception:
 - a. Submerged Arc Welding (SAW): Plate girders, fillet and butt joints in pipes, cylinders, columns and beams, and welds where 'downhand' or horizontal positions are possible.
 - b. Gas Metal Arc Welding (GMAW) must be used where SAW is not applicable (such as for angled connections and anything irregular or short).
 - c. Field welding will be allowed only in special circumstances; in such cases Flux Core Arc welding (FCAW) will be specified
2. Do not begin structural welding until joint elements are inspected for surface preparation, fit-up, and cleanliness of surface to be welded and are then bolted or tacked in intimate contact and adjusted to dimensions shown on drawings, or both, with allowance for any weld shrinkage that is expected. No members are to be spliced without prior approval by the Commissioner.
 - a. Containment surface preparation debris must meet SSPC-Guide 6 guidelines.
3. Pre-heat and interpass temperature must be in accordance with Table 4.2 (including footnotes) of the AWS Code for Welding in Building Construction. The temperature must be measured from the side opposite to that which the pre-heat is applied, where possible.
4. All groove welds must be continuous and full penetration welds unless otherwise shown on the design drawings. Welds made without the aid of a back-up bar must have their roots chipped, ground or roughened out to sound metal from the second side, before welding is done from the second side.
5. All welds must be sound throughout. There may be no crack in any weld or weld pass. Weld may be considered sound if it contains only slight porosity or fusion defects which are well dispersed.
6. The heat, input, length of weld and sequence of weld must be controlled to prevent distortions. The surfaces to be welded and the filler metals to be used must be subject to inspection before any welding is performed.

3.4 SHOP PAINTING AND CLEANING

A. Finishing, coating, plating

1. Shop painting and factory finishing will be preferred to field painting whenever possible. Where applicable, finishes and surface preparations based on a physical process such as abrasive blasting, grinding, buffing and polishing are preferred to coatings and solvent based cleaning. Where coatings are necessary powder-coated fabrication is preferred to painting and plating. Avoid plated metals especially those using cadmium and chromium as plate material or cyanide or copper/formaldehyde based electroless copper as the plating solution.

B. Remove all rust, scale, grease and other detrimental foreign matter in accordance with SSPC-SP 3, Power Tool Cleaning, unless conditions/opportunities listed below apply.

1. Use surface preparation classification recommended by paint manufacturer, SSPC or Master Painters Institute (MPI) for paint product used.



- a. SSPC-Guide 6, Guide for Containing Debris Generated During Paint Removal Operations, must be followed for all applicable surface preparation techniques.
- C. Immediately after surface preparation, apply structural steel primer paint where specified, in accordance with manufacturer's instructions and at a rate to provide dry film thickness of not less than 2.0 mils. Use painting methods which result in full coverage of joints, corners, edges and exposed surfaces. Use type of primer paint as specified in "Materials" article above. Apply two coats to surfaces that will be inaccessible after erection
- D. Paint all structural steel in accordance with the foregoing specification, except as follows:
 - 1. Steel which is to receive spray-on fireproofing.
 - 2. Within 2" of field welds or welds made after paint is applied.
 - 3. Faying surfaces in bolted connections must be prepared per Section 3.2 of the RCSC "Specification for Structural Joints Using High-Strength Bolts."
 - 4. Machined surfaces and threaded parts required for adjustment of the structure. Protect these with suitable rust inhibiting coating which may be removed after final installation of the work so that proper finished coatings may be applied.

3.5 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.
 - 1. Fill vent and drain holes that will be exposed in the finished Work unless they will function as weep holes, by plugging with zinc solder and filing off smooth.

3.6 SOURCE QUALITY CONTROL

- A. Refer to testing and inspection requirements specified in Article 1.7 "TESTING AND INSPECTION."

3.7 EXAMINATION

- A. Verify field measurements prior to start of erection. Check the alignment and elevation of all column supports and location of all anchor bolts with transit and level instruments before starting erection. Notify the Commissioner of any errors. Obtain The Commissioner's approval of methods proposed for correcting errors prior to proceeding with corrections and erection.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.8 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless



otherwise indicated.

3.9 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- C. Column billets and bearing plates must be supported and aligned on steel wedges, shims, or leveling nuts. After the supported members have been plumbed and properly positioned by instrument and anchor nuts tightened, the entire bearing area under the plate must be packed solidly with grout specified in another Section. Wedges and shims must be set back a minimum of 3/4" from the edges of plates and must be left in place. Leveling plates are not permitted.
- D. Plumbing, Leveling and Bracing
 - 1. Structural steel must be erected true and level, and temporary bracing must be introduced wherever necessary to provide for all loads to which the structure may be subjected, including equipment and the operation thereof. Such bracing must be left in place as long as may be required for safety. No welding may be done or bolts drawn up tight until structural steel has been properly aligned. Obtain approval for guy locations to assure lack of interference with operations of other trades.
- E. Drifting
 - 1. Light drifting necessary to draw holes together will be permitted, but drifting of unfair holes will not be permitted. Twist drills must be used to enlarge holes as necessary to the next larger size; use next larger size bolts as required. Reaming that weakens the members, or make it impossible to fill the holes properly or to adjust accurately after reaming, will not be allowed.

3.10 FIELD CONNECTIONS

- A. In addition to the requirements for shop connections comply with the following:
 - 1. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.
 - 2. Joint Type: As noted on structural drawings.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
 - 2. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.



3.11 REPAIRS AND PROTECTION

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.

3.12 WASTE MANAGEMENT

- A. Separate and recycle waste materials in accordance with DDC General Conditions Section 01 74 19 "Construction Waste Management and Disposal" and to the maximum extent feasible.
- B. Separate for recycling and place in designated containers the following metal waste in accordance with the Waste Management Plans and local recycler standards: Steel, iron, galvanized steel, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass and bronze.
- C. Collect all metal cut-offs and scraps and recycle as above.
- D. Fold up metal banding, flatten and place in designated area.
- E. Close and seal tightly all partly used paint and finish containers and store protected in a well-ventilated, fire-safe area at moderate temperature.
- F. Designated un-used paint for:
 - 1. Immediate re-use
 - 2. Long term maintenance needs
 - 3. Recycling by an appropriate facility.
 - 4. Donation
- G. Place empty containers of solvent-based paints in areas designated for hazardous materials.
- H. Do not dispose of paints or solvents by pouring on the ground. Place amounts too small to re-use in designated containers for proper disposal
- I. Place materials defined as hazardous or toxic waste in designated containers.

END OF SECTION 05 12 00



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 but is not limited to the following as shown on the drawings and as specified herein:
1. Floor deck
 2. Roof deck
 3. Headed shear studs
 4. All necessary deck supports and reinforcing other than principal framing members including diagonals at columns, angles, plates, and etc.
 5. Flashing, cell closures, closure plates and sheet metal work required to contain concrete.
 6. Ceiling hanger tabs at new decking composite with concrete where new suspended ceilings are required.
- B. Related Sections:
1. Division 03 Section "Cast in Place Concrete"
 2. Division 04 Section "Unit Masonry"
 3. Division 05 Section "Structural Steel Framing."
 4. Division 05 Section "Metal Fabrications."
- C. Related Requirements:
1. Concrete and reinforcement over decking
 2. Structural Steel
 3. Shoring of metal deck where unsupported span exceeds the allowable
 4. Ceiling Systems
 5. Mechanical and electrical where supported from deck
 6. Fireproofing systems
 7. Sheet metal work

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".



- B. Product Data: Product data, including manufacturer's specifications, load tables, section properties and installation instructions for each type of decking and accessories.
- C. Shop Drawings: Shop drawings for all installations showing gauges, deck layout, type of deck, any shoring required, where located, welding details necessary for fabrication to fit in place, and all accessories. Do not use reproductions of the Contract Drawings. In addition, include the following:
 - 1. Ceiling tab, fillers, closures and similar items.
 - 2. Show placement of headed shear studs connectors with respect to the flutes of the metal deck. Variation from the specified deck configuration may result in a decrease of the capacity of the studs, requiring more studs.
- D. Product Certificates: Certification of specification compliance for each item specified.
- E. Shop drawings showing exact placement of all headed shear studs connectors with respect to the flutes of the metal deck. Variation from the specified deck configuration may result in a decrease of the capacity of the studs, requiring more studs.
- F. Reports
 - 1. Submit certification of recycled steel content. Certification must clearly indicate post-consumer AND post-industrial recycled steel content for the particular member or members used.
 - 2. Submit mill and fabricator certification if in compliance with ISO14001.
 - 3. Submit verification of finishing process:
 - a. Provide a cut sheet and a Material Safety Data Sheet (MSDS) for all shop and field paints used highlighting VOC limits and chemical and mineral component limits.
 - b. For heavy metals in used plating processes: Provide a cut sheet and a Material Safety Data Sheet (MSDS) for each plating material and related compounds highlighting chemical component limits.
 - c. Certification of recycled zinc content for galvanized products: Provide cut sheets clearly indicating whether the galvanized products used meet the minimums for post-consumer OR post-industrial recycled contents. Or, if cut sheets are not available, obtain a written affidavit from the manufacturer stating the recycled content percentage and if the recycled content is post-consumer or post-industrial.
 - 4. Submit verification of biodegradable or low VOC, and low Hazardous Air Pollutants (HAPS) cleaning solutions. Provide a cut sheet and a Material Safety Data Sheet (MSDS) for all cleaning solutions used in the surface preparation of steel components. Highlight VOC limits and chemical component limits.
- G. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that each of the following complies with requirements:
 - 1. Power-actuated mechanical fasteners.
 - 2. Acoustical roof deck.
- H. Evaluation Reports: For steel deck.



1.4 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel decking according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."
- B. Metal deck unit sizes and gages are indicated on the drawings. Gages indicated on the drawings are a minimum. Thickness of deck may be required to be increased by deck manufacturer for loadings indicated on drawings.
- C. Unit must span over three or more supports except where steel layout does not permit.
- D. Maximum allowable deflection under live load plus super imposed dead load must not exceed (1/360) of the span or (1/4) inch whichever is less.
- E. Deck must be sized as unshored. Shoring of deck is not permitted unless specifically shown in areas on the drawings.
- F. Use of piercing, non-piercing, and integral hanger tabs is not permitted at roof deck.
- G. Units included in a fire rated assembly must be classified in appropriate UL design.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Except as modified by governing codes and by this specification, comply with the applicable provisions and recommendations of the following codes and standards:
 - 1. New York City Building Code, 2014 Edition
 - 2. American Iron and Steel Institute (AISI) "Specification for the Design of Cold-Formed Steel Structural Members".
 - 3. American Welding Society (AWS), D1.1 "Structural Welding Code" and D1.3 "Structural Welding Code-Sheet Steel".
 - 4. Steel Deck Institute (SDI) "Design Manual for Composite Decks, Form Decks, and Roof Decks".
 - 5. ASTM Standards as applicable in the New York City Building Code and as noted in this specification.
- C. Fabricator Qualifications: The work under this section must be performed by a fabricator and erector submitting conclusive evidence of having satisfactorily completed work of similar scope and of having the necessary skill, equipment, facilities and capacities to fabricate and perform the erection in accordance with the construction schedules and in full compliance with all requirements of the Contract Documents.
- D. FM Global Listing: Provide steel roof deck evaluated by FM Global and listed in its "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings.

1.6 DELIVERY, STORAGE AND HANDLING



- A. Deliver materials to site at such intervals to ensure uninterrupted progress of work. However, efforts should be made to minimize the disturbance to site and soil conditions for example, by not requiring excessive areas to be put aside for on-site storage.
- B. Store materials to permit easy access for inspection and identification. Keep all materials in a safe, dry, off ground location, using pallets, platforms, or other supports. Protect all materials from corrosion and deterioration, discoloration or staining. Make efforts to minimize any wastage and ensure that as much waste as possible is recycled.
- C. Do not store materials on structure in a manner that might cause distortion or damage to members of supporting structures. Repair or replace damaged materials or structures as directed.

1.7 PROJECT CONDITIONS

- A. Examine all work prepared by other trades to receive work of this section and report any defects affecting installation to the contractor for correction. Commencement of work will be construed as complete acceptance of preparatory work by other trades.
- B. If the supporting beams are not properly aligned or sufficiently level to permit proper bearing of the steel decking units, the contractor must bring the matter to the attention of the subcontractor for corrective action. The steel decking units are not to be placed until the necessary correlations are made.
- C. Installation of the deck and shear studs will be inspected by the Commissioner

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."
- B. Fire-Resistance Ratings: Comply with ASTM E 119; 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 MANUFACTURERS

- A. Supply manufactured deck units in accordance with the applicable requirements of the Steel Deck Institute's "Design Manual for Floor Decks and Roof Decks".
- B. Deck must be manufactured by one of the following:



1. United Steel Deck (manufactured by Canam)
2. Wheeling Corrugating Co.
3. Vulcraft
4. Or approved equal.

2.3 DECK MATERIALS

- A. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, with the minimum section properties indicated on the drawings. Contractor must provide heavier gauge if minimum gauge indicated is not adequate to support total loads as shown on the drawings.
- B. Composite Floor Deck: Fabricate panels, with integrally embossed or raised pattern ribs and interlocking side laps, to comply with "SDI Specifications and Commentary for Composite Steel Floor Deck," in SDI Publication No. 31, with the minimum section properties indicated on the drawings. Contractor must provide heavier gauge if the minimum gauge indicated is not sufficient to support construction loads as unshored forms and/or total load as indicated on the drawings based on the composite section. Deck must have deformations specifically designed to produce composite action between the deck and the concrete slab by mechanical bond.
- C. Non-composite Form Deck: Fabricate ribbed-steel sheet non-composite form-deck panels to comply with "SDI Specifications and Commentary for Non-composite Steel Form Deck," in SDI Publication No. 31, with the minimum section properties indicated on the drawings. Contractor must provide heavier gauge if minimum gauge indicated is not adequate to support total loads as shown on the drawings.

2.4 ACCESSORIES

- A. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- B. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
- C. Anchor clips, vent clips, welding washers, flashing, saddle plates, sump pans, other accessories must be those types, sizes, and configurations recommended by the decking manufacturer, and must be of the same material and finish as the deck units. All accessories must conform to ASTM A653/A63M.
- D. Cell closure flexible strips, and fillers must be of material in compliance with applicable building code governing class of construction.
- E. Provide metal closure strips at edges of all slabs and openings that serve as pour stops for concrete. Gauge must be sufficient to span or cantilever from steel beams.
- F. Roof sump pans: Fabricate from a single piece of galvanized sheet steel of the same quality as the deck units; not less than nominal 0.0747" (14 gauge) thick before galvanizing; with bottoms level after erection and sloping sides to direct water flow to the drain, unless otherwise shown. Provide sump pans of adequate size to receive roof drains and with bearing flanges not less than 3" wide. Recess pans not less than 1-1/2" below



the roof deck surface, unless otherwise shown or required by deck configuration. Weld to deck at maximum 12" o.c.

- G. Headed studs for shear connectors must be per drawings manufactured from cold drawn wire and conforming to ASTM A 108, Grades 1010 thru 1020.
 - 1. Subject to compliance with requirements, studs must be manufactured by one of the following:
 - a. Nelson
 - b. KSM
 - c. Tru-Weld
 - d. Or approved equal

2.5 FABRICATION

- A. Fabricate deck units in accordance with the AISI's "Specification for the Design of Cold-Formed Steel Structural Members" and accepted shop drawings. Fabricate deck units to the sizes and configurations indicated and cut to lengths which will span not fewer than three supporting members; use only full length units at overhang where indicated in a manner that laps fit tightly. Locate openings for penetrations where indicated and provide support framing and edge reinforcement for all openings.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 SPECIAL INSPECTION

- A. Special inspection of the metal deck and shear stud installation will be performed by an inspection agency retained by the City of New York. The inspection agency will work under the direction of the Commissioner. Contractor must provide the inspection agency with the following:
 - 1. Schedule of all work in both shop and field with at least ten days written notice before commencement of either activity.
 - 2. A complete set of approved shop and erection drawings.



- B. Refer to Article 3.7 “FIELD QUALITY CONTROL” for additional requirements for field inspections.

3.4 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section. Erection must closely follow the erection of structural steel.
- B. Install temporary shoring before placing deck panels if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members as per load schedule provided on contract documents.
- D. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- E. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work, per drawings and manufacturer's specifications.
- F. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- G. Headed shear studs must be installed by welding through metal deck onto beam below. Automatic welding machinery of approved design, amperage, duration of current, etc., must be used. Studs must be tested by testing laboratory in accordance with AWS Procedures for Bend Test; replace all studs which do not pass test.
- H. All welding must be performed by competent experienced welding mechanics. All welds must be given a protective coat of paint as specified in painting article of section 051200.
- I. All abraded or damaged protective surfaces of steel decking work must be touched up with a protective coat of paint by this contractor as erected.

3.5 ROOF DECK INSTALLATION

- A. Fasten roof-deck panels to steel supporting members per drawings.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports per drawings.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing per manufacturer's specification but not less than 1-1/2 inches, with end joints as follows:
 - 1. End Joints: Lapped 2 inches minimum or butted at Contractor's option.
- D. All unframed openings in roof deck must be reinforced per the drawings.



- E. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld to substrate to provide a complete deck installation.
 - 1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.

3.6 FLOOR DECK INSTALLATION

- A. Fasten floor-deck panels to steel supporting members per the drawings. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports per the drawings.
- B. End Bearing: Install deck ends over supporting frame with a minimum end bearing per manufacturer's specification but not less than 1-1/2 inches, with end joints as follows:
 - 1. End Joints: Lapped 2" minimum or butted at Contractor's option.
- C. All unframed deck openings in composite deck with concrete larger than 6" must be reinforced per the drawings.
- D. At composite deck with concrete, metal hanger tabs must be installed at all panel sidelaps 24 inches o.c., longitudinally 24 inches o.c. to create a grid nominally 24 inches by 24 inches. Tabs must be 18 gauge minimum, capable of supporting the specified ceiling, tabs must be a minimum of 18 gauge capable of supporting ceiling and all other suspended loads or 200 pounds, whichever is greater.
- E. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations unless otherwise indicated.
- F. Sealing cellular deck openings, butt joints, and junctions with trench headers with tape is not included in this Section. Floor-Deck Closures: Weld steel sheet column closures, cell closures, and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.
- G. The steel decking units must be placed on the supporting steel framework and adjusted to final position before being permanently fastened. Each unit must be brought to proper bearing on the supporting beams.
- H. Deck must, where possible, span 3 or more supports.
- I. The side laps of adjacent units must be fastened by approved method (to be shown on shop drawings) between supports at intervals as noted on the drawings.
- J. All welding must be performed by competent experienced welding mechanics. All welds must be given a protective coat of paint as specified in painting article of section 051200.
- K. All abraded or damaged protective surfaces of steel decking work must be touched up with a protective coat of paint by this contractor as erected.
- L. Headed shear studs must be installed by welding through metal deck onto beam below. Automatic welding



machinery of approved design, amperage, duration of current, etc., must be used. Studs must be tested by testing laboratory in accordance with AWS Procedures for Bend Test; replace all studs which do not pass test.

- M. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.7 FIELD QUALITY CONTROL

- A. Special inspections will be performed per Article 3.3 "SPECIAL INSPECTIONS". For field inspections the contractor must provide the inspection agency with the following:
 - 1. Schedule of all work in field with at least ten days' written notice before commencement of either activity.
 - 2. A complete set of approved shop and erection drawings.
 - 3. Order sheets, material bills, shipping bills and mill test reports.
 - 4. Representative sample pieces as requested by the testing agency.
 - 5. Full and ample means and assistance for testing all material.
 - 6. Proper facilities, including scaffolding, temporary work platforms, etc., for inspection of the work in the mills, shop and field.
- B. Each person installing connections must be assigned an identifying symbol or mark and all shop and field connections must be so identified so that the inspector can refer back to the person making the connection.
- C. The following minimum criteria must be adhered to in testing of welds:
 - 1. All welds must be examined by visual means.
 - 2. 25% of all welds, selected randomly, must be measured.
 - 3. In addition, all welds subject to tensile stress must be examined by the Ultrasonic Method for 100% of their length.
 - 4. 10% of all manual fillet welds must be tested by the magnetic particle method.
 - 5. 1'-0" at each end of automatic fillet welds must be tested by the magnetic particle method.
 - 6. 100% of groove welds must be tested by the ultrasonic method.
- D. Field inspection will include examination of decking for welding and touching-up of shop coat.
- E. Inspection of welding will be such as to assure that the work is within the quality requirements specified below and elsewhere in this section of the specifications and will include:
 - 1. Ascertainment that the electrodes and flux used for the SAW, GMAW and FCAW welding processes conform to the requirements of this section of the specifications.
 - 2. Ascertainment that the approved welding procedures and sequence are followed without deviation, unless specific approval for change is obtained from the Commissioner.
 - 3. The testing agency must be prepared to utilize the following approved methods of testing:
 - a. Liquid penetrant inspection: ASTM E 165.
 - b. Magnetic particle: ASTM A 709.
 - c. Radiographic inspection: ASTM E 94 and E 1032.



- d. Ultrasonic inspection: ASTM E 114 and AWS, Chapter 6, Section C.
- F. When defects are revealed, additional inspection by whatever method is deemed necessary by the inspector must be performed to the extent necessary to assure that the full amount of defect has been located. No further work may be done on the assembly or sub-assembly in question until all the necessary corrections have been made. Defects must be repaired, using the same welding procedure that was used initially in making the weld, unless otherwise approved by the Commissioner. Inspection of the repaired weld must be by the same method that was used to reveal the defect. A second repair of a defective area may not be made without approval of the Commissioner.
- G. A distinguishing mark will be placed on all work that has been inspected and approved. Material or work that is not acceptable will be designated by words such as "REJECT" or "REPAIR" marked directly on the material or work.
- H. Testing agency will report inspection results promptly and in writing to Contractor and Commissioner.
- I. Remove and replace work that does not comply with specified requirements.
- J. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

3.8 CLEANING UP

- A. Remove all equipment, unused materials and debris from the site immediately upon the completion of this work.

END OF SECTION 05 31 00



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. Rough hardware.
2. Light steel framing and supports, not included as part of work of other trades.
3. Miscellaneous steel trim.
4. Countertop supports.
5. Aluminum planters.
6. Sleeves in concrete walls and slabs.
7. Steel framing, bracing, supports, anchors, bolts, shims, fastenings, and all other supplementary parts indicated on drawings or as required to complete each item of work of this Section.
8. Prime painting, touch-up painting, galvanizing and separation of dissimilar metals for work of this Section.
9. Cutting, fitting, drilling and tapping work of this Section to accommodate work of other Sections and of concrete, masonry or other materials as required for attaching and installing work of this Section.

- B. Related Sections

1. Section 05 12 00 "Structural Steel Framing"
2. Section 09 90 00 "Painting and Coating"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Manufacturer's Literature: Submit manufacturer's specifications, load tables, dimension diagrams, anchor details and installation instructions for products to be used in the fabrication of miscellaneous metal work, including paint products.
- C. Shop Drawings: Shop drawings for the fabrication and erection of all assemblies of miscellaneous iron work which are not completely shown by manufacturer's data sheets. Include plans and elevations at not



less than 1" to 1'-0" scale, and include details of sections and connections at not less than 3" to 1'-0" scale. Show anchorage and accessory items.

- D. Welding shall be indicated on shop drawings using AWS symbols and showing length, size and spacing (if not continuous). Auxiliary views shall be shown to clarify all welding. Notes such as 1/4" weld, weld and tack weld are not acceptable.
- E. Certification: For items to be hot-dip galvanized, identify each item galvanized and to show compliance of application. The Certificate shall be signed by the galvanizer and shall contain a detailed description of the material processed and the ASTM standard used for the coating and, the weight of the coating. In addition, and as attachment to Certification, submit reports of testing and inspections indicating compliance with the provisions of this Section.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Shop Assembly: Pre-assemble items in 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 re-assembly and coordinated installation.
- C. Reference Standards: The work is subject to requirements of applicable portions of the following standards:
 - 1. AISC "Manual of Steel Construction"
 - 2. AWS D1.1 "Structural Welding Code"
 - 3. SSPC SP-3 "Surface Preparation Specification No. 3, Power Tool Cleaning"
 - 4. SSPC PA-1 "Painting Application Specification"
 - 5. "Handbook on Bolt, Nut and Rivet Standards," Industrial Fasteners Institute.
- D. Steel Materials: For steel to be hot dip-galvanized, provide steel chemically suitable for metal coatings complying with the following requirements: carbon below 0.25 percent, silicon below 0.24 percent, phosphorous below 0.05 percent, and manganese below 1.35 percent. Notify galvanizer if steel does not comply with these requirements to determine suitability for processing.
- E. Engage the services of a galvanizer who has demonstrated a minimum of three (3) years' experience in the successful performance of the processes. The Commissioner has the right to inspect and approve or reject the galvanizer/galvanizing facility.
- F. The galvanizer/galvanizing facility must have an ongoing Quality Control/Quality Assurance program which has been in effect for a minimum of three years and shall provide the Commissioner with process and final inspection documentation. The galvanizer/galvanizing facility must have an on-premise testing facility capable of measuring the chemical and metallurgical composition of the galvanizing bath and pickling tanks.
- G. Inspection and testing of hot-dip galvanized coating shall be done under the guidelines provided in the American Hot-Dip Galvanizers Association (AGA) publication "Inspection of Products Hot-Dip Galvanized After Fabrication."



PART 2 PRODUCTS

2.1 MATERIALS

A. Metals

1. Metal Surfaces, General: For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
2. Steel Plates, Shapes and Bars: ASTM A36.
3. Steel Tubing: Cold formed, ASTM A500; or hot rolled, ASTM A501.
4. Structural Steel Sheet: Hot rolled, ASTM A1011; or cold rolled, ASTM A1008, Class 1; of grade required for design loading.
5. Galvanized Structural Steel Sheet: ASTM A924, of grade required for design loading. Coating designation G90.
6. Steel Pipe: ASTM A53, type and grade as selected by fabricator and as required for design loading; black finish unless galvanizing is indicated; standard weight (Schedule 40), unless otherwise indicated.
7. Gray Iron Castings: ASTM A48, Class 30, unless another class is indicated or required by structural loads.
8. Malleable Iron Castings: ASTM A47, grade as selected by fabricator.
9. Aluminum Plate and Sheet: ASTM B209, Alloy 6061-T6.
10. Aluminum Extrusions: ASTM B221, Alloy 6063-T6.
11. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.
12. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A47, or cast steel, ASTM A27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A153.

- B. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107.

C. Fasteners

1. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.
2. Bolts and Nuts: Regular hexagon head type, ASTM A307, Grade A.
3. Anchor Bolts: ASTM F1554, Grade 36.
4. Lag Bolts: ASME B18.2.1.



5. Machine Screws: ASME B18.6.3.
 6. Plain Washers: Round, carbon steel, ASME B18.22.1.
 7. Masonry Anchorage Devices: Expansion shields, FS FF-S-325.
 8. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as required.
 9. Lock Washers: Helical spring type carbon steel, ASME B18.21.1.
- D. Shop Paint: Shop prime all non-galvanized miscellaneous metal items using Series 88 Azaron Primer made by Tnemec, ICI Devco "Rust Guard" quick dry alkyd shop coat No. 41403, "Interlac 393" by International Protection Coatings, or approved equal.
1. If steel is to receive high performance coating as noted in Section 09 90 00, Painting and Coating, shop prime using primer noted in Section 09 90 00, Painting and Coating.
- E. Bituminous Paint: Cold applied asphalt emulsion complying with ASTM D1187.
- F. Galvanizing Repair Coating: For touching up damaged galvanized surfaces after erection. Apply to a dry film thickness of 1.5 to 3.0 mils.
1. Subject to compliance with requirements, products that may be incorporated into the Work include the following:
 - a. Z.R.C. Worldwide; Silver Galv
 - b. Brite Products; Brite Zinc
 - c. Duncan Galvanizing Corp.; ZiRP
 - d. Or approved equal.

2.2 PRIME PAINTING

- A. Scope: All ferrous metal (except galvanized steel) shall be cleaned and shop painted with one coat of specified ferrous metal primer. No shop prime paint required on galvanized steel or aluminum work.
- B. Cleaning: Conform to Steel Structures Painting Council Surface Preparation Specification SP 3 (latest edition) "Power Tool Cleaning" for cleaning of ferrous metals which are to receive shop prime coat.
1. Steel to get high performance coating as noted in Section 09 90 00, Painting and Coating shall be cleaned as per SSPC SP.6 "Commercial Blast Cleaning."
- C. Application
1. Apply shop prime coat immediately after cleaning metal. Apply paint in dry weather or under cover. Metal surfaces shall be free from frost or moisture when painted. Paint all metal surfaces including edges, joints, holes, corners, etc.
 2. Paint surfaces which will be concealed after shop assembly prior to such assembly. Apply paint in accordance with approved paint manufacturer's printed instructions, and the use of any thinners, adulterants or admixtures shall be only as stated in said instructions.



3. Paint shall uniformly and completely cover the metal surfaces, 2.0 mils minimum dry film thickness. No work shall be shipped until the shop prime coat thereon has dried.

- D. Touch-Up: In the shop, after assembly and in the field, after installation of work of this Section, touch-up damaged or abraded portions of shop prime paint with specified ferrous metal primer.
- E. Apply one shop coat to fabricated metal items, except apply two (2) coats of paint to surfaces inaccessible after assembly or erection. Change color of second coat to distinguish it from the first.

2.3 GALVANIZING

- A. Scope: All ferrous metal exposed to the weather, and all ferrous metals indicated on drawings or in specifications to be galvanized, shall be cleaned and then hot-dipped galvanized after fabrication.
- B. Avoid fabrication techniques that could cause distortion or embrittlement of steel items to be hot-dip galvanized. Fabricator shall consult with hot-dip galvanizer regarding potential warpage problems or handling problems during the galvanizing process that may require adjustment of fabrication techniques or design before finalizing shop drawings and beginning of fabrication.
- C. Cleaning: Thoroughly clean metal surfaces of all mill scale, rust, dirt, grease, oil, moisture and other contaminants prior to galvanizing.
- D. Application: Hot-dip galvanizing shall conform to the following:
 1. ASTM A143: Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel.
 2. ASTM A123: Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 3. ASTM A153: Galvanized Coating on Iron and Steel Hardware - Table 1.
 4. ASTM A384: Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies.
 5. ASTM A385: Practice for Providing High Quality Zinc Coatings.
 6. ASTM A924: Galvanized Coating on Steel Sheets.
 7. Minimum weight of galvanized coating shall be two (2) oz. per square foot of surface.
- E. Fabricate joints which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.
- F. All galvanized materials must be inspected for compliance with these specifications and marked with a stamp indicating the name of the galvanizer, the weight of the coating, and the appropriate ASTM number.
- G. To minimize surface imperfection (eg: flux inclusions), material to be galvanized shall be dipped into a solution of Zinc Ammonium Chloride (pre-flux) immediately prior to galvanizing. The type of galvanizing process utilizing a flux blanket overlaying the molten zinc will not be permitted.
- H. After galvanizing all materials not exposed to view must be chromated by dipping material in a 0.2% chromic acid solution.



- I. Galvanized surfaces, where exposed to view, must have a smooth, level surface finish. Where this does not occur, piece shall be rejected and replaced to the acceptance of the Commissioner.

2.4 PROTECTIVE COATINGS

- A. Whenever dissimilar metals will be in contact, separate contact surfaces by coating each contact surface prior to assembly or installation with one coat of specified bituminous paint, which shall be in addition to the specified shop prime paint. Mask off those surfaces not required to receive protective coating.

2.5 WORKMANSHIP

A. General

1. Miscellaneous metal work shall be fabricated by an experienced fabricator or manufacturer and installed by an experienced tradesman.
2. Materials, methods of fabrication, fitting, assembly, bracing, supporting, fastening, operating devices, and erection shall be in accordance with drawings and specifications, approved shop drawings, and best practices of the industry, using new and clean materials as specified, having structural properties sufficient to safely sustain or withstand stresses and strains to which materials and assembled work will be subjected.
3. All work shall be accurately and neatly fabricated, assembled and erected.

- B. Shop Assembly: Insofar as practicable, fitting and assembly of work shall be done in shop. Shop assemble work in largest practical sizes to minimize field work. Ensure that the shop-fabricated miscellaneous metal items will properly fit the field condition. In the event that shop-fabricated miscellaneous metal items do not fit the field condition, the item shall be returned to the shop for correction.

- C. Cutting: Cut metal by sawing, shearing, or blanking. Flame cutting will be permitted only if cut edges are ground back to clean, smooth edges. Make cuts accurate, clean, sharp and free of burrs, without deforming adjacent surfaces or metals.

- D. Holes: Drill or cleanly punch holes; do not burn.

- E. Connections: Make connections with tight joints, capable of developing full strength of member, flush unless indicated otherwise, formed to exclude water where exposed to weather. Locate joints where least conspicuous. Unless indicated otherwise, weld or bolt shop connections; bolt or screw field connections. Provide expansion and contraction joints to allow for thermal movement of metal at locations and by methods approved by the Commissioner.

1. Welding

- a. Shall be in accordance with AWS D1.1 and shall be done with electrodes and/or methods recommended by the manufacturer of the metals being welded.
- b. Welds shall be continuous, except where spot welding is specifically permitted. Welds exposed to view shall be ground flush and dressed smooth with and to match finish of adjoining surfaces; undercut metal edges where welds are required to be flush.
- c. All welds on or behind surfaces which will be exposed to view shall be done so as to prevent distortion of finished surface. Remove weld spatter and welding oxides from all welded surfaces.



2. Bolts and Screws: Make threaded connections tight with threads entirely concealed. Use lock nuts. Bolts and screw heads exposed to view shall be flat and countersunk. Cut off projecting ends of exposed bolts and screws flush with nuts or adjacent metal.
- F. Operating Mechanism: Operating devices (i.e. pivots, hinges, etc.) mechanism and hardware used in connection with this work shall be fabricated, assembled, installed and adjusted after installation so that they will operate smoothly, freely, noiselessly and without excessive friction.
- G. Built-In Work: Furnish anchor bolts, inserts, plates and any other anchorage devices, and all other items specified under this Section of the Specifications to be built into concrete, masonry or work of other trades, with necessary templates and instructions, and in ample time to facilitate proper placing and installation.
- H. Supplementary Parts: Provide as necessary to complete each item of work, even though such supplementary parts are not shown or specified.
- I. Coordination: Accurately cut, fit, drill and tap work of this Section to accommodate and fit work of other trades. Furnish or obtain, as applicable, templates and drawings to or from applicable trades for proper coordination of this work.
- J. Exposed Work
 1. In addition to requirements specified herein and shown on drawings, all surfaces exposed to view shall be clean and free from dirt, stains, grease, scratches, distortions, waves, dents, buckles, tool marks, burrs, and other defects which mar appearance of finished work.
 2. Metal work exposed to view shall be straight and true to line or curve, smooth arrises and angles as sharp as practicable, miters formed in true alignment, profiles accurately intersecting, and with joints carefully matched to produce continuity of line and design.
 3. Exposed fastenings, where permitted, shall be of the same material, color and finish as the metal to which applied, unless otherwise indicated, and shall be of the smallest practicable size.
- K. Preparation for Hot-Dip Galvanizing: Fabricator shall correctly prepare assemblies for galvanizing in consultation with galvanizer and in accordance with applicable Reference Standards and applicable AGA publications for the "Design of Products to be Hot-Dip galvanized After Fabrication." Preparation shall include but not be limited to the following:
 1. Remove welding flux.
 2. Drill appropriate vent holes and provide for drainage in inconspicuous locations of hollow sections and semi-enclosed elements. After galvanizing, plug vent holes with shaped lead and grind smooth.

2.6 MISCELLANEOUS METALS ITEMS

A. Rough Hardware

1. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Section 06 10 00, Rough Carpentry.



2. Fabricate items to sizes, shapes and dimensions required. Furnish malleable iron washers for heads and nuts which bear on wood connections; elsewhere, furnish steel washers.
- B. Miscellaneous Light Steel Framing
1. Light steel framing, bracing, supports, framing, clip angles, shelf angles, plates, etc., shall be of such shapes and sizes as indicated on the drawings and details or as required to suit the condition and shall be provided with all necessary supports and reinforcing such as hangers, braces, struts, clip angles, anchors, bolts, nuts, welds, etc., as required to properly support and rigidly fasten and anchor same in place and to steel, concrete, masonry and all other connecting and adjoining work.
 2. All light steel framing steel shall be furnished and erected in accordance with the applicable requirements of the "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" by the American Institute of Steel Construction and as specified herein.
- C. Miscellaneous Steel Trim: Provide shapes and sizes for profiles shown. Except as otherwise indicated, fabricate units from structural steel shapes and plates and steel bars, with continuously welded joints and smooth exposed edges. Use concealed field splices wherever possible. Provide cutouts, fittings and anchorages as required for coordination of assembly and installation with other work.
- D. Countertop Supports: Steel framing as indicated or required to support countertops. Conceal framing under countertops and within wall behind countertops. Provide supports to withstand a concentrated load of not less than three hundred (300) lbs. applied at any point with a deflection not to exceed L/240 for the length of the countertop.
- E. Aluminum Planters: Fabricated from 3/8" aluminum plate with formed 1/4" aluminum brackets, fully welded together with continuously welded joints and smooth exposed edges.
1. Finish: Natural aluminum, slightly buffed.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; including threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.
- B. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry, or similar construction.
- C. Fitting Connections: Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch up shop paint coat. Do not weld, cut or abrade the



surfaces of exterior units which have been hot dip galvanized after fabrication, and are intended for bolted or screwed field connections.

- D. Field Welding: Comply with AWS D1.1 for procedures of manual shielded metal-arc welding, appearance, and quality of welds made, and methods used in correcting welding work.
- E. Touch-Up Painting: 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. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- F. Field Touch-Up of Galvanized Surfaces: Touch-up shop applied galvanized coatings damaged during handling and installation. Use galvanizing repair coating specified herein for galvanized surfaces.

END OF SECTION 05 50 00



THIS PAGE INTENTIONALLY LEFT BLANK



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. Blocking and miscellaneous wood.
 - 2. Plywood backing panels for telephone and electrical closets.
 - 3. Rough hardware.
 - 4. Installation only of finish hardware.
 - 5. Installation only of doors and hollow metal frames.
- B. Related Sections
 - 1. Section 06 40 23 "Interior Architectural Woodwork"
 - 2. Section 07 52 13 "Atactic-Polypropylene-Modified Bituminous Membrane Roofing"
 - 3. Section 08 11 13 "Hollow Metal Doors and Frames"
 - 4. Section 08 14 16 "Flush Wood Doors"
 - 5. Section 08 71 00 "Door Hardware"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Pressure Treatment: Include certification by treating plant stating chemicals and process used, net amount of salts retained and conformance with applicable standards.
- C. Fire-Retardant Treatment: Include certification by treating plant that treatment material complies with New York City Building Code and that treatment will not bleed through finished surfaces.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Lumber Standard: Comply with PS 20.



- C. Plywood Standard: Comply with PS 1 and American Plywood Assoc. (APA).
- D. Shop fabricate carpentry work to the extent feasible and where shop fabrication will result in better workmanship than feasible for on-site fabrication.
- E. Grade Marks: Identify lumber and plywood by official grade mark.
 - 1. Lumber: Grade stamp to contain symbol of grading agency certified by Board of Review, American Lumber Standards Committee, mill number or name, grade of lumber, species grouping or combination designation, rules under which graded where applicable, and condition of seasoning at time of manufacture.
 - a. S-Dry: Maximum nineteen (19) percent moisture content as per ASTM D 2016.
- F. Installation of doors, frames and hardware shall conform to the minimum standards of "Installation Guides for Doors and Hardware" of the Door and Hardware Institute.

1.5 PRODUCT HANDLING

- A. Deliver carpentry materials to the site ready to use with each piece of lumber clearly marked as to grade, type and mill, and place in an area protected from the elements.
- B. Deliver rough hardware in sealed kegs and/or other containers which shall bear labels as to type and kind.
- C. Pile lumber for rough usage, when delivered to the site in stacks to ensure drainage and with a minimum clearance of six (6) inches above grade. Cover stacks with tarpaulins or other watertight coverings. Store grounds and similar small sized lumber inside the building as soon as possible after delivery.
- D. Do not store seasoned lumber in wet or damp portions of the building.
- E. Protect fire retardant treated materials against high humidity and moisture during storage and erection.
- F. Remove delivered materials which do not conform to specified grading rules or are otherwise not suitable for installation from the job site and replace with acceptable materials.
- G. Hardware shall be sorted and stored in space assigned by Contractor and shall be kept at all times under lock and key. The safety and preservation of all items delivered will be the responsibility of the Contractor.

1.6 JOB CONDITIONS

- A. Installer must examine the substrates and supporting structure and the conditions under which the carpentry work is to be installed, and notify the Contractor in writing of conditions detrimental to the work. Do not proceed with the installation until unsatisfactory conditions have been corrected in a manner acceptable to the Installer and the Commissioner.
- B. Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow proper attachment of other work.



PART 2 PRODUCTS

2.1 WOOD MATERIAL

A. General

1. All wood shall be sound, flat, straight, well seasoned, thoroughly dry and free from all defects. Warped or twisted wood shall not be used.
2. For miscellaneous wood blocking, grounds, furring as required, use Utility Grade Coastal Douglas Fir or Southern Pine, free from knots, shakes, rot or other defects, straight, square edges and straight grain, air seasoned with maximum moisture content of nineteen (19) percent. Wood shall be S4S, S-Dry, complying with PS-20.
3. Plywood and rough carpentry for telephone and electrical closets, provide 3/4" thick C-D EXT-APA plywood, fire retardant treated as specified herein.

B. Wood Treatment

1. All interior wood material specified herein shall be fire retardant treated to comply with the AWWA standard U1 to achieve a flame spread rating of not more than 25 (UL Class "FR-S") when tested in accordance with UL Test 723 or ASTM E 84. The fire retardant chemicals used to treat the lumber must comply with FR-1 of AWWA Standard P49 and be free of halogens, sulfates and ammonium phosphate.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Arch Wood Protection Inc.; Dricon or comparable product by one of the following:
 - 1). Koppers
 - 2). Hoover
 - 3). Or approved equal.
 - b. After treatment, kiln dry to a moisture content of fifteen (15) percent; if wood is to be painted or finished, kiln dry to a moisture content of twelve (12) percent.
 - c. Provide UL approved identification on treated materials.
2. For exterior blocking, roofing and sheet metal, pressure treat wood with copper azole, Type B (CA-B); ammoniacal copper quat (ACQ) or similar preservative product that contains no arsenic or chromium. Preservative shall comply with AWWA Standard U1, (.25 lbs./cubic foot of chemical in wood).
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Arch Wood Protection Inc.; Wolmanized Natural Select or comparable product by one of the following:
 - 1). Koppers
 - 2). Hoover
 - 3). Or approved equal.
 - b. After treatment, kiln dry to a maximum moisture content of fifteen (15) percent.
3. Treated wood which is cut or otherwise damaged shall be further treated in accordance with the AWWA Standard M-4.

2.2 HARDWARE

- #### A. Rough Hardware for Treated Woods and Exterior Use: Hot-dipped galvanized or Type 304 stainless steel.



- B. Nails: Common steel wire, untreated for interior work as per ASTM F 1667.
- C. Bolts: Standard mild steel, square head machine bolts with square nuts and malleable iron or steel plate washers or carriage bolts with square nuts and cut washers conforming to the following:
 - 1. Bolts: ASTM A 307, Grade A.
 - 2. Nuts: ASTM A 563.
 - 3. Lag Screws and Bolts: ASME B 18.2.1.
- D. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
 - 2. Material for Treated Woods and Exterior Use: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.
- E. Wood Screws: ASME B 18.6.1.
- F. Concrete and Masonry Anchors: Standard expansion-shield self-drilling type concrete anchors where so shown or noted on the drawings, or where approved by the Commissioner.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION OF FINISH HARDWARE

- A. Hardware shall be carefully fitted and securely attached, in accordance with these specifications and the instructions of the various manufacturers.
- B. Unless otherwise noted, mount hardware units at heights established in Section 08 11 13 "Hollow Metal Doors and Frames."
- C. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, install each item completely and then remove and store in a secure place during the finish application. After completion of the finishes, re-install each item. Do not install surface-mounted items until finishes have been completed on the substrate.
- D. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- E. Drill and countersink units which are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.



- F. Cut and fit threshold and floor covers to profile of door frames, with mitered corners and hair-line joints. Join units with concealed welds or concealed mechanical joints. Cut smooth openings for spindles, bolts and similar items, if any.
- G. All keys used shall be construction keys which are to be tagged with fiber discs as approved, clearly labeled with identifying inscriptions and then neatly arranged in a temporary cabinet. All construction keys shall be returned to the City of New York.
- H. Adjusting and Cleaning
 - 1. Adjust and check each operating item of hardware and each door, to ensure proper operation and function of every unit. Lubricate moving parts with type lubrication recommended by manufacturer (graphite type if no other recommended). Replace units which cannot be adjusted and lubricated to operate freely and smoothly as intended for the application made.
 - 2. Final Adjustment: Wherever hardware installation is made more than one month prior to substantial completion or occupancy of a space or area, return to the work during the week prior to substantial completion or occupancy, and make a final check and adjustment of all hardware items in such space or area. Clean and re-lubricate operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

3.3 INSTALLATION OF DOORS AND FRAMES

A. Preparation

- 1. Remove welded-in shipping spreaders installed at factory.
- 2. Prior to installation and with installation spreaders in place, adjust and securely brace standard steel door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.
- 3. Drill and tap doors and frames to receive non-templated mortised and surface-mounted door hardware.

B. Installation

- 1. General: Provide doors and frames of sizes, thicknesses, and designs indicated. Install steel doors and frames plumb, rigid, properly aligned, and securely fastened in place.
- 2. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.



- a. Install frames in accordance with ANSI 250.11, Recommended Erection Instructions for Steel Frames, unless more stringent requirements are specified herein.
 - b. At fire-protection-rated openings, install frames according to NFPA 80.
 - c. Where frames are fabricated in sections due to shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - d. Install frames with removable glazing stops located on secure side of opening.
 - e. Frames set in masonry walls shall have door silencers installed in frames before grouting.
 - f. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - g. Check plumb, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
3. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor and secure with post-installed expansion anchors.
 - a. Floor anchors may be set with powder-actuated fasteners instead of post-installed expansion anchors if so indicated and approved on Shop Drawings.
4. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames conforming to the requirements of Section 07 21 00, "Thermal Insulation."
5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar; refer to Section 04 20 00 "Unit Masonry" for installation of frames in masonry walls.
6. Ceiling Struts: Extend struts vertically from top of frame at each jamb to supporting construction above, unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction above. Provide adjustable wedged or bolted anchorage to frame jamb members.
7. Installation Tolerances: Adjust steel door frames for squareness, alignment, twist, and plumb to the tolerance given in HMMA 841 of ANSI/NAAMM, current edition.
8. Steel Doors: Fit hollow metal doors accurately in frames to the tolerances given in HMMA 841 of ANSI/NAAMM, current edition.
 - a. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
9. Glazing: Comply with installation requirements in Section 08 80 00 "Glazing" and with standard steel door and frame manufacturer's written instructions.
 - a. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c., and not more than 2 inches o.c. from each corner.

C. Wood Doors

1. Condition doors to average prevailing humidity in installation area prior to hanging.
2. Install doors in accordance with manufacturer's instructions.



3. Fit door to frames and machine for hardware to whatever extent not previously worked at factory as required for proper fit and uniform clearance at each edge.
 4. Clearances: Install doors to meet clearance requirements specified in Section 08 14 16 "Flush Wood Doors."
 5. Fire-Rated Doors: Install in corresponding fire-rated frames in accordance with the requirements of NFPA No. 80. Provide clearances complying with the New York City Building Code.
- D. Adjustments: Check and readjust operating finish hardware items just prior to final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including doors or frames which are warped, bowed or otherwise unacceptable.

3.4 BLOCKING AND MISCELLANEOUS WOOD

A. General

1. Erect rough carpentry true to line, levels and dimensions required; squared, aligned, plumbed, and securely fastened in place.
2. Shim where required to true up furring, blocking and the like. Use wood or metal shims only.
3. Do all cutting, fitting, drilling and tapping of other work as required to secure work in place and to perform the work included herein. Do all the cutting and fitting of carpentry work, for the work of other trades as required.

B. Blocking and Miscellaneous Wood

1. Furnish and install all wood grounds, furring, blocking, curbs, bucks, nailers, etc., that may be necessary and required in connection with the carpentry and with the work described for any other trades and including required carpentry for electrical fixtures. All blocking and nailers shall be continuous wherever required, whether or not so indicated.
2. Blocking shall be as required for the proper installation of the finished work and for items in mechanical sections as required. Blocking, edgings, stops, nailing strips, etc., shall be continuous, unless distinctly noted otherwise. Provide blocking as required to install all equipment. Provide blocking and nailers where shown or required to fasten interior sheet metal work.
3. Fastening for wood grounds, furring and blocking shall be of metal and of type and spacing as best suited to conditions. Hardened steel nails, expansion screws, toggle bolts, self-clinching nails, metal plugs, inserts or similar fastenings shall be used, of suitable type and size to draw the members into place and securely hold same.

C. Rough Lumber for Roofing and Sheet Metal

1. Furnish and install all wood nailing strips and wood blocking required in connection with respective types of roofing, fans, flashings, and sheet metal work, using preservative treated wood as herein before specified.
2. Wood blocking shall be of sizes and shapes as indicated on the drawings and/or designed for the reception of curb flashings for roof ventilators and similar items.



3. All nailing strips and blocking shall be carried out in accordance with the printed installation instructions, and/or recommendations of the accepted manufacturer of the roofing materials, and in coordination and cooperation with the sheet metal work trades.
4. All blocking and nailing strips shall be firmly secured in place using counter bored bolt and nut fastenings, or secured by any other proposed flush surfaced fastenings.
5. Wood nailing strips or blocking required to be embedded in concrete work shall be furnished in time due for placing, prior to start of concrete operations. Locations and spacings of nailing strips or blocking shall be performed in coordination with the concrete trades, as required for respective installations.

3.5 TELEPHONE AND ELECTRICAL EQUIPMENT MOUNTING BOARDS

- A. Furnish and install 3/4" thick plywood panels to the walls of the telephone and electrical equipment rooms in accordance with ConEdison requirements.
- B. Secure to wall using proper devices for substrates encountered, spaced twelve (12) inches o.c., maximum around the edges, 1-1/2" from corners, and in three (3) rows of three (3) each in the field. Recess fastening devices flush with the plywood surface. Adjacent panels shall be butted with 1/16" space between without lapping.

3.6 ROUGH HARDWARE

- A. Securely fasten rough carpentry together. Nail, spike, lag screw or bolt as required by conditions encountered in the field and the Contract Documents.
- B. Provide rough or framing hardware, such as nails, screws, bolts, anchors, hangers, clips, inserts, miscellaneous fastenings, and similar items of the best quality and of the proper size and kind to adequately secure the work together and in place, in a rigid and substantial manner.
- C. Secure rough carpentry to masonry with countersunk bolts in expansion sleeves or other acceptable manner, with fastenings not more than sixteen (16) inches apart. Secure woodwork to hollow masonry with toggle bolts spaced not more than sixteen (16) inches apart.
- D. Countersink bolts in nailers and other rough woodwork and include washers and nuts. Cut bolts off flush with surfaces and peen as may be required to receive finished work.
- E. Inserts to secure wood nailers to concrete shall be malleable iron threaded inserts with 3/8" diameter bolts of length to allow for countersinking. Locate at end of each nailer and at intervals not exceeding thirty (30) inches o.c.
- F. Furnish to the mason for building into the work, or attaching the work which is to be built in, anchors, bolts, wall plates bolted to masonry, corrugated wall plugs, nailing blocks, etc., which are required for the proper fastening and installation for the work or other items as called for in this Section.
- G. Detailed instructions with sketches of necessary requirements, shall be given to the masonry trade showing the location and other details of such nailing devices.

END OF SECTION 06 10 00



SECTION 06 40 23 – INTERIOR ARCHITECTURAL WOODWORK

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. Hardwood veneer plywood library shelving, cabinets, tops and sides.
2. Tables and desks as detailed.
3. Pantry cabinets and counters.
4. Millwork with solid surfacing material finish.
5. Miscellaneous hardwood veneer shelving, counters and cabinets as shown and detailed.
6. Wood base.
7. Wood millwork and counters with plastic laminate finish.
8. Hardware for architectural woodwork.
9. Wood framing and rough lumber as required for work of this Section.
10. Wood grounds, blocking, nailers, furring as required for work of this Section.
11. All rough hardware and fastenings for work of this Section.
12. Drilling concrete and masonry, drilling and/or tapping metal work, as required, for the installation of work of this Section.
13. Back painting as specified herein.
14. Shop finish of work of this Section, except items indicated herein to be shop primed only.

- B. Related Sections

1. Section 06 10 00 "Rough Carpentry"
2. Section 06 61 16 "Solid Surfacing Fabrications"
3. Section 07 92 00 "Joint Sealants" for caulking between architectural woodwork and any wall, floor, or ceiling joints.



4. Section 09 90 00 "Painting and Coating" for field finishing of architectural woodwork.

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Shop Drawings
 1. Submit shop drawings of all woodwork specified and indicated on the drawings. Shop drawings shall indicate room plans and elevations at 3/4" equals 1'-0" scale and typical construction details at 3" equals 1'-0" scale. Shop drawings shall indicate all materials, thicknesses and finishes.
 2. Shop drawings shall show all finish hardware, anchors, fastenings and accessories.
 3. Shop drawings shall show all jointing, joint treatment and butt jointing in veneers and plastic laminate.
 4. Shop drawings for cabinet work must show centerline height and horizontal location of all required internal wall blocking.
 5. Where architectural woodwork deviates from AWI standards noted herein, shop drawings must identify these deviations.
- C. Samples: Submit samples of each of the following items:
 1. Plastic laminate, twelve (12) inches square, including a section of outside corner.
 2. Opaque finish wood veneer laminated to particleboard, twelve (12) inches square for each color, gloss and finish specified or shown.
 3. Each type and finish of wood base, eight (8) inches long, finish as specified.
 4. Cabinet hardware.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. The quality standards of the Architectural Woodwork Institute, "Architectural Woodwork Standards" (AWS), 2nd Edition, dated July 1, 2016, shall apply to all workmanship, including materials and installation, for architectural woodwork, and by reference are made a part of this specification. All work shall conform to "Premium" grade requirements of the AWS unless otherwise modified herein.
- C. In the event of a dispute as to the quality grade (or grades), the Contractor shall call upon the Architectural Woodwork Institute for an inspection under AWI's Quality Certification Program which shall include a QCP Inspection and Report. The Contractor agrees to abide by the decision of this Report. The cost of said inspection and report shall be borne by the Contractor.
- D. Employ only tradesmen experienced in the fabrication and installation of architectural woodwork.
- E. Installer Qualifications: An entity meeting the requirements of the DDC General Conditions Section 014000 "Quality Requirements," Article 1.7.C.1.



1.5 PRODUCT HANDLING

- A. All materials and work of this Section shall be protected from damage from time of shipment from shop to substantial completion of work. Cover, ventilate, and protect work of this Section from damage caused by weather, moisture, heat, staining, dirt, abrasions, any other causes which may adversely affect appearance or use, or which may cause deterioration of finish, warping, distortion, twisting, opening of joints and seams, delamination, loosening, etc., of work of this Section.
- B. Keep all finish carpentry, millwork, and cabinet work under cover both in transit and at the premises. Do not deliver any finish carpentry, millwork or cabinet work before it is required for installation. Protect such work to avoid damage in transit, during erection and after erection until acceptance of the building; use all such methods to provide the proper protection.
- C. Deliver finish carpentry, millwork, and cabinet work in a dry stable condition; protect same against injury and dampness. Do not store or install finish carpentry, millwork or cabinet work until after the concrete, masonry and plaster work are thoroughly dry.

1.6 JOB CONDITIONS

- A. Humidity Controls: The ambient relative humidity at the site, including both the storage and the installation areas, shall be maintained between 25% and 55% prior to delivery and through the life of the installation.
- B. Determine equilibrium moisture content and maintain required temperature and relative humidity as required for a tolerance of plus or minus one (1) percent of the specified optimum moisture content until woodwork receives specified finishes. Refer to "Guide to Wood Species Selection," AWI, for method of determining equilibrium moisture content values.
- C. Areas to receive architectural woodwork must be fully enclosed with windows and/or curtain wall installed and glazed, exterior doors in place, HVAC systems operational, and temporary openings closed. Any plaster, wet grinding and concrete work shall be fully dry.
- D. Architectural woodwork shall be allowed to come to equilibrium on site for 7 days prior to installation.

PART 2 PRODUCTS

2.1 BASIC REQUIREMENTS

- A. Wood Moisture Content: Provide kiln-dried (KD) lumber with an average moisture content range of nine (9) to twelve (12) percent for exterior work and six (6) to eleven (11) percent for interior work.
- B. Compatibility of Grain and Color: Commissioner reserves the right to select materials for best compatibility between visually related members and veneers.
- C. Machine and sand woodwork to comply with requirements of Standards for specified grade.
- D. Fabricate woodwork to dimensions, profiles and details shown. Rout or groove back of flat trim members, kerf backs of other wide flat members except plywood or veneered members.
- E. Miter joints by joining, splining and gluing to comply with requirements for the specified grade.



- F. Inspect each piece of lumber and plywood or each unit of woodwork after drying; do not use twisted, warped, bowed or otherwise damaged or defective wood.

2.2 GENERAL - MATERIALS

- A. Softwood lumber shall conform to the requirements of the latest edition of American Lumber Standards Simplified Practice Recommendation R-16. Grades shall conform to the grading rules of the Architectural Woodwork Institute, and shall bear the labels and certificates from the AWI certification program indicating that woodwork complies with requirements of grades specified, and a mark of mill identification.
- B. Framing and Rough Lumber: No. 1 KD grade Southern Pine or Dense Construction grade Douglas Fir, having extreme fiber in bending stress of at least 1700 psi, surfaced four sides (S4S). Provide fire retardant treatment meeting requirements of Section 06 10 00 Rough Carpentry.
- C. Grounds, Blocking, Nailers, Furring: Southern Pine, Douglas Fir or Sitka Spruce, grade to suit particular purpose and to be straight, square edged, straight grained, surfaced four sides (S4S), and which will retain nails and screws without splitting. Provide fire retardant treatment.
- D. Lumber: AWS Section 3 with the following requirements:
 - 1. Hardwood for Opaque Finish: Any hardwood which, when finished, will not show any grain, imperfection or other surface defects when used with the opaque finish specified.
- E. Plywood: AWS Section 4; veneer core, particleboard or plywood core unless otherwise specified, and with the following requirements:
 - 1. Hardwood: Premium Grade, face veneers as shown or specified.
 - 2. Particleboard: Premium Grade, ANSI A208.1, fire retardant for wall paneling only. Particleboard shall be certified to meet EPP CPA 3-08 formaldehyde emission limit of 0.18 ppm, and contain no added formaldehyde resins.
 - 3. Medium-Density Fiberboard (MDF): Conforming to ANSI A208.2, Grade 130 and ANSI MR10 moisture-resistant properties on 5/8" or thicker board. MDF shall be certified to meet EPP CPA 3-08 formaldehyde emission limit of 0.21 ppm, and contain no added formaldehyde resins.
 - 4. Edges: Banded with hardwood in accordance with Premium Grade Standards.
- F. Veneers
 - 1. Hardwood Veneer Plywood: Premium Grade, Rift-Cut Oak.
 - 2. Hardwood for Clear Finish: Solid Rift-Cut Oak.
 - 3. Face Veneers for Opaque Finish: Any closed grain hardwood veneer that, when finished, will not show grain, imperfection or other surface defects when used with the opaque finish specified.
 - 4. Opaque Finish
 - a. AWI Factory Finish System "Conversion Varnish, System 5, Opaque."
 - b. AWI Premium Grade.



- c. Degree of Sheen: Satin.
- d. No grain to show.

2.3 PLASTIC LAMINATE

- A. Face Sheets: NEMA Publication LD3, Grade GP50, Type I, 0.05" thick. Color, pattern and finish as scheduled
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Abet Laminati; product indicated on Drawings or comparable product by one of the following:
 - a. Formica
 - b. Nevamar
 - c. WilsonArt
 - d. Or approved equal.
- B. Backing Sheets: Non-decorative, high-pressure plastic laminate, NEMA LD3, Grade BK20, 0.02" thick.
- C. Edges: Finish with plastic laminate to match face and applied before face sheets are applied, unless otherwise shown or specified.
- D. Through-Color Plastic Laminate: NEMA Publication LD3, Solid Color Laminates; ColorCore2 Laminate by Formica, Solicor by Wilsonart, Nevamar or approved equal.
 - 1. Color, Pattern and Finish: See Finish Schedule.

2.4 METAL

- A. Steel
 - 1. Structural Steel Shapes and Plates: ASTM A 36.
 - 2. Hot-Rolled Carbon Steel Sheets: Commercial quality, ASTM A 569, may be used for concealed parts only.
- B. Primer for Unexposed Metal: Zinc chromate primer.

2.5 MISCELLANEOUS PRODUCTS

- A. Fasteners
 - 1. Wood Screws: FS FF-S-111, type, size, material and finish as required for the condition of use.
 - 2. Nails: FS FF-N-105, type, size, material and finish as required for the condition of use.
 - 3. Anchors: Type, size, material and finish as required for the condition of use.
 - 4. Staples: Upholstery type staples of sufficient strength to hold fabric taut in place without sagging.
- B. Adhesives
 - 1. For Laminating Plastic Laminate Surfaces: Urea resin, Type II, as recommended by fabricator.



2. For All Other Uses: Polyvinyl acetate resin emulsion or other type as recommended by the fabricator.

2.6 CABINETS WITH PLASTIC LAMINATE FINISH

A. General

1. Fabricate all cabinetry and millwork to the "Premium Grade" standards of the AWS, Section 10.
2. Face construction of cabinets shall be "Flush Overlay."
3. Provide 3/4" thick doors, drawer fronts and fixed panels (including thickness of plastic) except where required to be thicker by Standards; and provide flush units.
4. Provide dust panels of 1/4" thick plywood or tempered hardboard above compartments and drawers, except where located directly below countertops.
5. Exposed Edges: Plastic laminate matching exposed panel surfaces. Ease exposed edge of overlap sheet.

B. Plastic Laminate

1. Plastic Laminate for Horizontal Surfaces: 0.050" thick, general purpose type (high pressure).
2. Plastic Laminate for External Vertical Surfaces: 0.028" thick, general purpose type (high pressure).
3. Plastic Laminate for Post Forming: 0.042" thick, post forming (high pressure).
4. Plastic Laminate for Cabinet Linings: 0.020" thick, cabinet liner (high pressure).
5. Plastic Laminate for Concealed Panel Backing: 0.020" thick, backer type (high pressure).
6. Plastic Laminate Colors and Patterns: As scheduled.

- C. Shop Assembly: All work shall be shop assembled. Work that is too large for entrance into the use area shall be fabricated in attachable sections with provisions for reconnection in the using space.

- D. Material Thicknesses: See drawings for general material thicknesses. Minimum thickness of solid lumber for web frames, trim, bases, etc., shall be 3/4". Minimum thickness of plywood and particleboard shall be 3/4".

- E. Sizes: See drawings for woodwork sizes required. The manufacturer shall check field dimensions and verify all openings and actual field conditions prior to fabrication of work.

- F. Manufacturer is responsible for rigidity and structural stability.

2.7 PLASTIC LAMINATE COUNTERTOPS

- A. Grade: Same as AWS grade required for cabinet work; plastic laminate finish.

- B. Construction



1. Provide back-splash and end-splash, where detailed; top-mounted square butt joint, fully covered with matching plastic laminate, eased edges.
2. Exposed Counter Edges: Plastic laminate matching surface, except as otherwise indicated. Ease exposed edges of overlap sheet.
3. Cut openings for equipment to be installed. Comply with equipment manufacturer's requirements, but provide internal corners of 1/8" minimum radius. Smooth saw cut and ease edges.
4. Seal cut edges of counter at openings for sinks and other "wet" equipment, using waterproofing compound recommended by plastic manufacturer and compatible with laminating adhesive.

2.8 ARCHITECTURAL WOODWORK HARDWARE

A. Hinges: Concealed hinges.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Hafele; Concealed hinges or comparable product by one of the following:
 - a. Sugatsune
 - b. Accuride
 - c. Or approved equal.

B. Catches: Magnetic; top and bottom.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Sugatsune
 - b. Hafele
 - c. Accuride
 - d. Or approved equal.

C. Pulls: As selected by the Commissioner.

D. Locks: As selected by the Commissioner.

E. Drawer Slides: Full extension, 100 lb. capacity.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Accuride; Model 7434 or comparable product by one of the following:
 - a. Sugatsune
 - b. Hafele
 - c. Or approved equal.

F. Shelf Supports: Pin and grommet system.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Hafele; No. 282.01.701 pin and 282.50.704 grommet or comparable product by one of the following:
 - a. Sugatsune



- b. Accuride
- c. Or approved equal.

G. Finish: Satin stainless steel.

2.9 WOOD FOR BASES

- A. Quality Standard: For the following types of interior architectural woodwork, comply with indicated standards as applicable.
 - 1. Standing and Running Trim: AWS Section 6.
 - 2. Miscellaneous Millwork: AWS Section 6.
- B. Woodwork for Paint Finish: Except as otherwise indicated, comply with the following:
 - 1. Grade: Premium.
 - 2. Species of Solid Wood: Solid, paint grade, sound clear Poplar or Birch.

2.10 FABRICATION - GENERAL

- A. Provide lumber framing for architectural woodwork, complete with all bracing and fastening devices as required for a rigid installation, and as required to sustain the imposed loads.
- B. Fabricate architectural woodwork to dimensions, profiles, and details indicated.
- C. Fabricate units in largest practicable sections. Assemble in the shop for trial fit, disassemble for shipment and reassemble with concealed fasteners. Where necessary for fitting at site, provide for scribing, trimming and fitting.
- D. Maintain relative humidity and temperature during fabrication, storage and finishing operations matching that of the areas of installation.
- E. Details indicate the required type and quality of construction. Modifications to conform to manufacturer's standards will be considered provided that they comply with the Contract Documents and maintain the profiles shown.
- F. Reinforcing shown is minimum. Provide additional reinforcing as required to ensure a rigid assembly. Exposed surfaces shall be free from dents, tool marks, warpage, buckle, glue and open joints, or other defects affecting serviceability or appearance. Accurately fit all joints, corners and miters. Conceal all fasteners. Make threaded connections up tight so that threads are entirely concealed.
- G. Factory finish all items where possible. Defer final touch-up, cleaning and polishing until after delivery and installation.
- H. Comply with AWI, Premium Grade, for sanding, filling countersunk fasteners, back priming and similar preparations for the finishing of architectural woodwork, as applicable to each unit of work.
- I. Prepare all countersunk wood screw attachments for wood plugs. Wood plugs shall match surrounding species and grain direction; putty filling is not acceptable.



2.11 FABRICATION - SPECIFIC ITEMS

A. Millwork

1. Include all preparations for mechanical, electrical, telephone and plumbing work required.
2. Provide cabinet hardware for millwork as shown.
3. Provide dust panels in body webs and between drawer units.
4. Provide wood veneers for exposed surfaces as specified herein before.
5. Hollow core doors will not be permitted.
6. Provide matching veneers for edge treatments of case body members where transparent finishes are indicated or specified.
7. Provide drawers with slides as specified. Drawers shall not rest on web body frames.
8. Provide wood veneers for transparent finish, of matching and continuing grain, for drawer and door edges.

- B. Standing and Running Trim: Provide standing and running trim of the sizes, profiles, species and finish as specified or shown and complying with AWS Section 6, Premium Grade.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 FRAMING

- A. Use specified framing lumber, sizes and spacing as indicated on drawings and as required to support loads.
- B. Framing shall be cut square on bearings, closely fitted, accurately set to required lines and levels, rigidly secured in place at bearings and connection with nails, lag screws and/or bolts as required by conditions.

3.3 GROUNDS, BLOCKING, NAILERS AND FURRING

- A. Provide all wood grounds, blocking, nailers, furring, and the like for work of this Section, where shown and where required, dressed to size indicated or required to suit the condition. Install grounds, blocking, nailers, furring, etc., rigidly, in proper alignment, trued with a long straight edge.

3.4 ROUGH HARDWARE

- A. Provide all rough hardware, such as nails, screws, bolts, anchors, hangers, clips and similar items. Hardware shall be of the proper size and kind to adequately secure the work together and in place, in a rigid and substantial manner. Use galvanized hardware at exterior walls, and at other locations where subject to moisture or where water will be present.



- B. Secure wood to concrete and to solid masonry with countersunk bolts in expansion sleeves or other approved manner, to steel with countersunk bolts, to hollow masonry and to drywall with heavy duty countersunk toggle bolts. Space fastenings not more than sixteen (16) inches apart. Hardened cut nails, power-driven fastenings, or other suitable devices may be used where approved by the Commissioner.
- C. Connections and fastenings shall be made in such manner as will compensate for swelling and shrinkage and shall permit the work to remain permanently in place without any splitting or opening of joints.

3.5 INSTALLATION OF CABINET FINISH HARDWARE

- A. All items of finish hardware furnished under this Section shall be carefully fitted and secured in place as part of the work of this Section. Ensure operation without forcing.
- B. After preliminary fitting of hardware, the Contractor shall remove trim for painting and finishing work; afterwards, reinstall the hardware in a permanent manner.
- C. Upon completion of the work, before final acceptance of the building by the City of New York, the Contractor shall, in the presence of the Commissioner, show that all hardware is in satisfactory working order; fit all keys in their respective locks and, upon acceptance of the work, shall tag and deliver all keys to the Commissioner.

3.6 GENERAL INSTALLATION

- A. Wall anchorage and general installation procedures for cabinetry work shall conform to AWS Section 10, Article entitled "Execution," Sub-Article 6.1, with all related sub-paragraphs.
- B. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level (including countertops), and with 1/16" maximum offset in flush adjoining surfaces, 1/8" maximum offset in revealed adjoining surfaces.
- C. Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.
- D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation.

3.7 CABINET WORK AND MILLWORK

- A. General
 - 1. Materials and workmanship shall conform to the Quality Standards of the Architectural Woodwork Institute specified herein and to the drawings.
 - 2. Fabricate all cabinet work and millwork completely in the shop, in complete and/or as large units as practical, leaving only fitting, assembly, installation and a minimum of fabrication and finishing to be done at the building. Assembled work shall be rigidly secured and permanently fastened together with concealed fasteners.
 - 3. Afford the Commissioner every facility for inspection of work at shop or mill at such times as the Commissioner may select.



4. As far as practicable, use concealed fastenings for joining and assembling the work. Where this is impossible, the means of securing shall be placed in inconspicuous places and methods of joining and assembling submitted for Commissioner's approval prior to fabrication.
 5. Mill all finish wood accurately to detail, with clean cut moldings, profiles and lines, machined, sanded smooth, housed, jointed, blocked, put together in the best manner, with provision for swelling and shrinkage, and to assure the work remaining in place without warping, splitting or opening of joints.
 6. Cut trim to dimensions and profiles shown, from solid stock.
 7. Make all trim and the like in single lengths wherever possible; joints mitered, glued and splined. Continuous members shall have tight flush joints, doweled or splined and glued.
 8. Make all joints hairline tight, fitted accurately and joined with hardwood splines or dowels, glued together, or by other method approved by the Commissioner. Use screws, not nails, for fastenings.
 9. Gluing shall, where practicable, be by the hot plate press method and glued surfaces shall be in close contact throughout. Glue stains on finished work will not be permitted.
 10. Cover surface fastenings, where permitted, with matching wood plugs or wood putty. Finish exposed edges of plywood with matching solid stock. Lock miter external corners; tongue and groove internal corners to allow for contraction and expansion.
 11. Machine sand with grain, finish with hand sanding, leave exposed surfaces free from machine or tool marks that will show through the finish.
 12. Work which adjoins drywall, concrete, or other finish shall be fitted and scribed in a careful manner and ample allowance shall be given for cutting and scribing.
 13. Erect work true to lines, levels and dimensions, square, aligned and plumb, securely and rigidly fastened in place.
- B. Cabinet Work: Provide all items of cabinet work indicated on drawings and as herein specified.
1. Tops, sides, backs, bottoms, dividers, shelves, fronts, doors and drawer fronts shall be of plywood or flakeboard core, with the specified wood veneer or plastic laminate as indicated on drawings.
 2. Drawer sides and backs shall be 1/2" thick solid clear selected white birch, suitable for clear finish. Drawer bottom shall be 3/8" thick plywood with clear selected white birch veneers, suitable for clear finish.
 3. Cabinet doors and drawers shall be flush mounted.
 4. Adjustable shelves in cabinets shall have grommets spaced 2" o.c.
 5. Fixed shelves shall be dadoed into side supports and glued.
 6. Shelves shall be 3/4" thick for spans up to 30"; for spans in excess of 30" to 48" shelves shall be 1" thick.



7. All cabinets shall have closed top, sides, bottom, and back with veneers to match face work. Cabinets to fit accurately into indicated locations; scribe moldings permitted only where indicated.
 8. Countertops, counters, counter fronts, shelves, etc., indicated on drawings to have plastic laminate, shall have plastic laminate shop applied to 3/4" thick core, with plastic laminate backing sheet on underside or back of countertops, counters and shelves. Plastic laminate shall be pressure laminated to core with laminate at external corners. Provide concealed wood framing to support plastic laminate counters, securely fastened to wall and to underside of counters.
- C. Countertops shall be installed to support a minimum concentrated live load of 150 lbs. acting downward at mid span at outer edge of counter without causing deformation and damage.

3.8 WOOD BASES

- A. Provide plywood backing, toggle bolted to substrate, if substrate not suitable for securing wood base.
- B. Machine wood bases from specified wood, to profiles indicated on drawings.
- C. Set base level and plumb. Where indicated on drawings, face of wood base shall be flush with wall above. Glue wood base to substrate or to plywood backing, and screw or nail wood base to substrate or to plywood backing with countersunk wood screws or with finishing nails, recess wood screw heads, and spackle with wood putty, set and spackle nails with wood putty. Do not nail or fasten wood base to floor. Ends of wood base shall be either splined or ship lapped.
- D. Where no wood backing occurs, screw apply base at each stud with screw countersunk and wood putty applied and sanded smooth and flush with base.

3.9 PAINTING AND FINISHING

- A. General: All painting and finishing work of this Section shall be shop applied, unless otherwise noted. All painting and finishing shall match approved samples. Field finish painting shall be as specified in Section 09 90 00, Painting and Coating.
- B. Back-Painting: All work of this Section in contact with concrete or masonry or other moisture areas and all concealed surfaces of cabinet and millwork, shall be back-painted with one (1) coat of oil based paint prior to installation, shop applied where practicable.

END OF SECTION 06 40 23



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 solid surfacing fabrications for shelves, circulation desk and table surfaces.

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: Indicate product description, fabrication information, and compliance with specified performance requirements.
- C. Shop Drawings
 - 1. Submit shop drawings of all solid surfacing fabrications specified and indicated on the drawings. Shop drawings shall indicate room plans and elevations at 3/4" equals 1'-0" scale and typical construction details at 3" equals 1'-0" scale. Shop drawings shall indicate all materials, thicknesses, jointing and finishes.
 - 2. Shop drawings shall show all finish hardware, anchors, fastenings and accessories.
- D. Samples: Submit 12" x 12" samples. Indicate full range of color and pattern variation. Samples must have outside corner/nosing/edging as shown on drawings and fully finished as if it were the final end-product. Approved samples will be retained as a standard for work.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Allowable Tolerances:
 - 1. Variation in Component Size: + 1/8".
 - 2. Location of Openings: + 1/8" from indicated location.
- C. Employ only tradesmen experienced in the fabrication and installation of solid surfacing fabrications.
- D. The work of this Section shall be provided by a firm having a minimum of three (3) years' experience on projects of similar size and quality to that specified and shown.



1.5 WARRANTY

- A. Warranty: The manufacturer shall warrant to the City of New York that the manufacturer will, at his option, repair or replace without charge, such product if it fails due to a manufacturing defect during the first 10 years after Substantial Completion. This includes all labor charges needed to restore or replace the product covered hereunder.

PART 2 PRODUCTS

2.1 SOLID SURFACING MATERIALS

- A. Material: Cast, filled, acrylic; not coated, laminated or of composite construction, meeting ANSI Z124.3, Type Six, and ISFA 2-01 "Classification and Standards for Solid Surfacing Material" as published by the International Surface Fabricators Association (ISFA).
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide E.I. duPont de Nemours and Company; Corian or comparable product by one of the following:
 - a. Formica Corporation
 - b. Avonite, Inc.
 - c. Or approved equal.
 - 2. Color: Pearl Gray.
 - 3. Thickness: 1/2" thick unless otherwise noted.

- B. Counters shall be adhesively joined with no exposed seams, having edge details shown on drawings.

2.2 ACCESSORY PRODUCTS

- A. Adhesive: Product recommended by solid surface material manufacturer.
- B. Sealant: Manufacturer's standard mildew-resistant, FDA/UL recognized silicone sealant in colors matching components.

2.3 FABRICATION

- A. Factory fabricate components exactly to sizes and shapes indicated, in accordance with approved shop drawings. Contractor shall verify in the field all installation conditions, prior to fabrication.
- B. Form joints between components using manufacturer's standard joint adhesive; without conspicuous joints. No joints or seams will be permitted other than those shown on the approved shop drawings, unless specifically approved by the Commissioner.
- C. Provide factory cutouts for plumbing fittings and accessories as indicated on the drawings.
- D. Cut and finish component edges with clean, sharp returns. Route radii and contours to template. Repair or reject defective and inaccurate work.
- E. Provide all custom sizes, shapes, curves, configurations, reveals, and edgings as called for and shown on the drawings in the dimension and thicknesses noted.



PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. Install components plumb and level, scribed to adjacent finishes, in accordance with approved shop drawings and product installation data.
- B. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work. Keep components and hands clean when making joints.
- C. All surfaces, other than those surfaces that are the mounting/gluing surfaces, must be fully polished to match the finished face of all components. Unfinished surfaces will be rejected.
- D. Final finished surfaces must be fully and evenly polished with manufacturer's recommended finishing products. Unfinished surfaces will be rejected.

END OF SECTION 06 61 16



THIS PAGE INTENTIONALLY LEFT BLANK



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. Sheet membrane waterproofing at Plaza and Terrace areas.
 - 2. Sheet membrane waterproofing for underslab conditions.
 - 3. Sheet membrane waterproofing for foundation wall surfaces.
 - 4. Sheet membrane waterproofing for blindside of foundation wall surfaces.
- B. Related Sections
 - 1. Section 03 30 00 "Cast-in-Place Concrete"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Shop Drawings: Typical installation details, showing details at flashings, at terminations, at joints, at intersection of horizontal and vertical surfaces, and at penetrations in membrane system.
- C. Samples - Submit
 - 1. Membrane, 6" x 6" samples of each membrane.
 - 2. 6" x 6" sample of flashing.
 - 3. 6" x 6" sample of drainage board.
- D. Manufacturer's Literature: Submit manufacturer's technical, safety data sheets, and installation literature for all materials of this Section. Submit Independent Test data indicating that membrane meets properties specified herein.
- E. Contractor's Certification: Submit per Article 1.4.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".



- B. Preinstallation Conference: Approximately 2 weeks prior to scheduled commencement of waterproofing installation, meet at Project site with Waterproofing Installer; preparer of substrate to receive waterproofing; installers of other work in and around waterproofing that must precede, follow, or penetrate waterproofing (including Mechanical and Electrical Installers as applicable); Commissioner; and waterproofing manufacturer's representative to review materials, procedures, schedules, and other requirements and conditions related to installing waterproofing.
- C. Qualifications of Subcontractors
 - 1. Subcontractors: All work of this Section shall be performed by a subcontractor who is approved by the manufacturer of the waterproofing material.
 - 2. Qualifications of Subcontractors: Subcontractors shall submit evidence of being bona fide waterproofing subcontractors, for a period of not less than three (3) years, and that they are properly instructed by the manufacturer of the waterproofing material for the installation of the manufacturer's material in accordance with the requirements of this Section.
- D. Manufacturer's Representative/Contractor's Certification
 - 1. Representative of the waterproofing material manufacturer shall be required to provide field instructions and supervision for the installation of the waterproofing systems at the start of the work of this Section.
 - 2. The manufacturer's representative shall be required to make sure that the workmen for waterproofing systems on the site of the Project are fully instructed in the handling and application of all the materials and shall see that all the materials are correctly installed.
 - 3. Upon completion of the Installation, submit to the Commissioner written certification that the representative of the manufacturer of the waterproofing material has supervised the work of this Section and that all materials were correctly installed.

1.5 STORAGE OF MATERIALS

- A. All materials shall be stored in their original tightly sealed containers or unopened packages; shall be clearly labeled with the manufacturer's name, brand name and number, and batch number of the material with expiration date where appropriate.
- B. Materials shall be stored in a neat and safe manner so as not to exceed the allowable live load of the storage area.
- C. Material shall be stored out of the weather in a clean, dry area.
- D. Liquid materials, such as adhesives, thinners and primers, shall be stored in areas away from sparks, open flames and excessive heat.

1.6 JOB CONDITIONS

- A. No application of waterproofing shall commence or proceed during inclement weather, or the threat of imminent precipitation.
- B. All surfaces to receive the system shall be thoroughly dry and free of dew or frost.



- C. Materials shall be stored until time of mixing at temperatures above 60 deg. F. to maintain a consistency suitable for mixing. Do no work below 40 deg. F.
- D. Prior to and during application, all dirt and dust shall be removed from surfaces either by vacuuming, sweeping, blowing with compressed air, or similar methods.
- E. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.

1.7 WARRANTY

- A. The manufacturer of the waterproofing system executed under this Section warrants the waterproofing system to be watertight and free from defects in materials and workmanship for a period of ten (10) years from date of Substantial Completion, at its own expense, repair and/or replace all other work which may be damaged as a result of such defective work, and which becomes defective during the warranty period.

1.8 PROTECTION

- A. Against Loads: Protect work of this Section against concentrated loads and any other loads or equipment that would damage the materials or work.
- B. Against Traffic: Do not permit traffic on horizontally installed work of this Section, except for workmen doing the work, during the installation, and after the installation until membrane systems are covered with protective boards or with the specified finishing materials.
- C. Against Damage: Protect vertically installed work of this section from damage by reinforcing and placement.
 - 1. Take and maintain necessary preventive measures to protect work of this Section from damage until Project is accepted.
 - 2. Rejection of Damaged Work
 - a. Damaged materials or work will be rejected.
 - b. Rejected materials or work must be immediately removed and replaced with new materials.

1.9 FIELD QUALITY CONTROL

- A. Construction Traffic:
 - 1. Limit construction traffic over completed membrane.
 - 2. Provide 1/2 in. plywood protection layer, where construction traffic is unavoidable.
- B. Inform Commissioner in writing on a daily basis of any of the following events. State specific location of each occurrence.
 - 1. Buckling to the Waterproofing and other deformations as a result of ground water events.
 - 2. Leakage through the finished waterproofing installation.
 - 3. Damage by other trades.



- C. Provide Manufacturer's Representative's report (prior to backfill) stating that the waterproofing has been inspected and is acceptable and eligible for manufacturer's warranty.

PART 2 PRODUCTS

2.1 WATERPROOFING MEMBRANE

- A. Type WP-01 - For accessible foundation walls and Plaza and Terrace waterproofing, provide:
 - 1. Bituthene 4000 sheet waterproofing membrane, 60 mils thick, and Bituthene Liquid Membrane 60 mils thick, for flashing, as manufactured by GCP Applied Technologies or approved equal noted above.
 - 2. CCW MiraDri sheet waterproofing membrane, 60 mils thick, and CCW LiquiSeal V Liquid Membrane by Carlisle Coatings & Waterproofing.
 - 3. MEL-ROL sheet waterproofing 60 mils thick and BEM 60 mils thick, for flashing as manufactured by WR Meadows with MEL-ROL Sheet Membrane accessory products- MEL-PRIME NE or MEL-PRIME WB, BEM, POINTING MASTIC.
 - 4. TREMproof 560 sheet waterproofing membrane, 60 mils thick, ExoAir Termination Mastic, Dymonic 100 or TREMproof 260 R-grade, by Tremco Commercial Sealants & Waterproofing
 - 5. Or approved equal.
- B. Type WP-02 - At underslab conditions, provide:
 - 1. "Preprufe 300R Plus" system by GCP Applied Technologies.
 - 2. CCW MiraPly H with SeamLock Technology by Carlisle Coatings & Waterproofing
 - 3. PRECON composite sheet membrane with Plasmatic Matrixby WR Meadows
 - 4. TREMproof Amphibia Sheet Waterproofing Membrane by Tremco Commercial Sealants & Waterproofing.
 - 5. Or approved equal.
- C. Type WP-03 - At blind side waterproof conditions, provide
 - 1. "Preprufe 160R Plus" system by GCP Applied Technologies or
 - 2. CCW MiraPly V with SeamLock Technology by Carlisle Coatings & Waterproofing
 - 3. PRECON composite sheet membrane with Plasmatic Matrix by WR Meadows
 - 4. TREMproof Amphibia Sheet Waterproofing Membrane by Tremco Commercial Sealants & Waterproofing.
 - 5. Or approved equal.
- D. HDPE membrane shall have a protective layer to protect the membrane from the weather and U.V. for up to 56 days before casting concrete against it.



- E. Latex/water based primer specifically formulated to provide adhesion of Waterproofing Membranes.
 - 1. Bituthene "4000" Conditioner by GCP Applied Technologies
 - 2. CCW 702 LV Adhesive by Carlisle Coatings & Waterproofing
 - 3. MEL-PRIME NE/Solvent based or MEL-PRIME WB/water based used as adhesive for MEL-ROL sheet waterproofing by WR Meadows
 - 4. Or approved equal.
- F. Bituthene Elastomeric Mastic: Rubberized asphalt base mastic.
- G. Tape: Double sided synthetic adhesive tape.
- H. Protection Board:
 - 1. 1/4" thick semi-rigid protection board, Bituthene Asphaltic Hardboard by GCP Applied Technologies
 - 2. CCW Protection Board HS by Carlisle Coatings & Waterproofing
 - 3. WR Meadows 1/4" PC-3 by WR Meadows.
 - 4. Tremco 2560 Asphaltic Protection Board
 - 5. Or approved equal.
- I. Two-component 100% solids trowel grade asphalt modified urethane.
 - 1. Bituthene Liquid Membrane by GCP Applied Technologies
 - 2. CCW LiquiSeal V by Carlisle Coatings & Waterproofing
 - 3. MEL-ROL Liquid Membrane by WR Meadows
 - 4. Or approved equal.
- J. Drainage Board/Composite: Prefabricated dimpled polystyrene drainage core with a non-woven filter fabric on one side and a polymer film on the reverse side
 - 1. Vertical Applications
 - a. Hydroduct 220 by GCP Applied Technologies
 - b. CCW MiraDrain 6000 by Carlisle Coatings & Waterproofing
 - c. MEL-DRAIN 5035 by WR Meadows
 - d. TREMDrain 1000 by Tremco Commercial Sealants & Waterproofing
 - e. Or approved equal.
 - 2. At horizontal applications,
 - a. Hydroduct 660" by GCP Applied Technologies.
 - b. CCW MiraDrain 9000 by Carlisle Coatings & Waterproofing
 - c. MEL-DRAIN 9055 by WR Meadows



- d. TREMDrain 2000NW by Tremco Commercial Sealants & Waterproofing
- e. Or approved equal.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSPECTION

- A. Examine the areas and conditions where membrane waterproofing is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work. Starting of work implies acceptance of substrate.

3.3 PREPARATION OF SURFACES TO RECEIVE WATERPROOFING

- A. Conform to the requirements of manufacturers guidelines.
- B. Earth or crushed stone substrates shall be compacted to produce an even, sound substrate. Loose aggregate, sharp protrusions and standing water shall be removed.

3.4 INSTALLATION

- A. General: Conform to recommendations and published specifications of the manufacturer' including environmental requirements and preparation requirements to receive waterproofing.
- B. Foundation Walls (Accessible Walls)
 - 1. General: The membrane, when in place must withstand a minimum static ground water pressure in accordance with ASTM D5385
 - 2. Priming: Application of primer shall be limited to what can be covered with Waterproofing Membrane in a given work day. Primed areas not covered by membrane during the work day will be reprimed. Apply primer by spray, roller or brush at a rate of 250 - 350 sq. ft. per gallon. Roller shall be natural material such as lamb's wool, having a nap of approximately one inch. Primer shall be applied to a clean, dry, frost-free and dust-free surface. Sufficient primer must be used on the day surface to condition it to a dust-free state suitable for the application of Waterproofing Membranes.
 - a. Surface Conditioner should not be applied below 25 deg. F. on vertical surfaces. Allow primer to dry 30 minutes. Conditioner is considered dry when the substrate returns to its original color.
 - b. Re-prime areas that become dusty or dirty prior to membrane installation.
 - 3. Membrane Installation: Apply Waterproofing Membrane vertically in sections of 8' in length or less. On higher walls apply two or more sections with the upper overlapping the lower by a least 2-1/2". Press all membrane in place with heavy hand pressure or rollers during application.
 - 4. Sealing Edge: Waterproofing Membrane shall be applied over the edge of the slab or over the top of the foundation or parapet wall. If the membranes are terminated on the vertical surface, a reglet or counter flashing may be used or the membrane may be terminated directly on the vertical surface by pressing very firmly to the wall. Press edges with a metal or hardwood tool such as a hammer or knife



handle. Apply a troweled bead of Mastic to all vertical and horizontal termination Liquid Membrane can be used as an alternative method at the Contractor's option.

5. Sealing Seams: All edges and end seams must be overlapped at least 2-1/2". Apply succeeding sheets with a minimum 2-1/2" overlap and stagger end laps. Roll or press the entire membrane firmly and completely as soon as possible. Patch misaligned or inadequately lapped seams with Membrane. Slit any fish mouths, overlap the flaps, and repair with a patch of waterproof membrane and press or roll in place. The edges of the patch shall be sealed with a troweling of mastic. Laps within 12" of all corners shall be sealed with a troweling of mastic.
6. Corner Forming: Outside corners must be free of sharp edges. Inside corners shall receive a fillet formed with Liquid Membrane, latex modified cement mortar mixed with cement mortar or epoxy mortar. Do not use fiber or wood cants. One of two methods may be used for treating corners at the General Contractor's option:
 - a. Apply Liquid Membrane 6" in each direction from the corner and form a fillet with a minimum 3/4" face.
 - b. Install an 11" minimum strip of Membrane centered on the corner. Install Membrane over the treated inside and outside corners.
7. Over waterproofing, apply drainage composite board by adhering board to cured membrane using tape or adhesive per manufacturer's recommendations; lap all edges 4" and conform to the following:
 - a. Install drainage layer directly over the membrane. Start at the low points on the wall and shingle all laps to the flow of water.
 - b. Splice drainage panels together by butting longitudinal edges of adjacent sheets and peeling back fabric to expose the cores of the panels. Install precut "lock strips" consisting of 4 dimple x 5 dimple sections of the drainage panel centered on the joint between the panels and spaced every 10 dimples along the length of the joint. Snap dimples of "lock strip" to dimples of each panel and reattach fabric over the panel joint.
 - c. Cut the core of the drainage panels around penetrations, and cut an "X" in the filter fabric and tape the fabric to the sides of the penetration.
 - d. Cover all terminal edges of the drainage composite with an integral fabric flap by tucking the fabric around the edge of the core and adhering the fabric to the bottom of the core.

3.5 INSTALLATION OF WATERPROOFING FOR BLINDSIDE WALLS AND BELOW GRADE UNDERSLAB WATERPROOFING

- A. General: Install adhesive coated HDPE composite sheet according to waterproofing manufacturer's written instructions.
 1. Install drainage layer directly over the membrane. Start at the low points on the wall and shingle all laps to the flow of water.
 2. Splice drainage panels together by butting longitudinal edges of adjacent sheets and peeling back fabric to expose the cores of the panels. Install precut "lock strips" consisting of 4 dimple x 5 dimple sections of the drainage panel centered on the joint between the panels and spaced every 10 dimples along the length of the joint. Snap dimples of "lock strip" to dimples of each panel and reattach fabric over the panel joint.



3. Cut the core of the drainage panels around penetrations, and cut an "X" in the filter fabric and tape the fabric to the sides of the penetration.
4. Cover all terminal edges of the drainage composite with an integral fabric flap by tucking the fabric around the edge of the core and adhering the fabric to the bottom of the core.

B. Preparation

1. Surfaces to receive blind side membranes must be smooth and sound, with no gaps or voids in excess of 1/2 in. earth and stone substrates must be compacted to produce an even, solid substrate. If required by membrane manufacturer, provide an additional layer of underlayment protection board over sharp or angular stone substrates. Surfaces to receive waterproofing shall be thoroughly dry and free of moisture.
2. General: Comply with manufacturer's instructions for preparing surface including joint or crack treatment.
3. Apply primer to substrate surfaces at rate recommended by manufacturer of primary waterproofing materials. Prime only area that will be covered by waterproofing membrane in same working day. Reprime areas not covered by waterproofing membrane within 24 hrs.

C. Wall Applications

1. Refer to manufacturer's literature for complete installation instructions but not limited to the following:
 - a. Apply Drainage Composite to a point 6" below grade line. Fasten drainage composite to the adjacent buildings foundation wall or soil retention system.
 - b. Peel back bottom flap of filter fabric and place core behind discharge pipe. Wrap loose filter fabric over and around discharge pipe. Tuck excess filter fabric behind pipe. Fold excess filter fabric at top termination down between drainage composite and membrane.
 - c. Apply membrane with the HDPE film facing the soil retention system or adjacent foundation. Remove the release liner and fasten membrane to Hydroduct drainage composite with large head nails or staples. All nail heads or staples must be covered with overlapping sheets of membrane.
 - d. Apply succeeding sheets by overlapping the previous sheet 3 inches along the uncoated edge of the membrane.
 - e. Overlap the ends of the membrane 3 inches. Apply Preprufe Tape centered over the end lap and roll firmly. Remove release liner.
 - f. Seal all transition, penetrations, tie down bracing and other conditions with initial membrane layer plus manufacturer's recommended accessory materials, prior to application of the full membrane.
 - g. Concrete must be poured within 30 days of membrane application. Protect membrane until concrete pour.
 - h. If membrane ties into a vertical membrane, leave an additional 12" flap of Preprufe membrane to tie into waterproof membrane.

D. Underslab Applications

1. Apply horizontal drainage composite board as recommended by manufacturer over the compacted sub-grade.



2. Apply the membrane over the drainage composite board with the HDPE side facing the drainage composite board and the treated white coating surface facing the concrete to be poured. The membrane may be installed at any convenient length. Apply succeeding sheets by overlapping previous sheets 3" along the self-adhesive edge of the membrane. Remove the silicone coated release liner covering the membrane and roll the side lap to assure a tight seal.

3.6 SEAM REINFORCEMENT FOR HDPE COMPOSITE SHEETS ONLY

- A. Provide a 6 in. strip of modified bituminous sheet membrane peel and stick membrane centered behind all laps.
- B. At locations where a salvage edge is not present and at end laps, lap sheets 6 in., apply a 1/8 in. thick by 6 in. wide application of liquid membrane between sheets, to provide a 6 in. wide seal.
- C. Integration of old onto new pre-applied sheet membrane.
 1. Integration of Sheet Membrane onto Sheet Membrane that has been installed in excess of 30 days prior
 - a. Lap sheets 12 in., apply a 1/8 in. thick by 12 in. wide application of fluid membrane between sheets, to provide a 12 in. wide seal at this location.
 - b. Install Waterproofing Tape centered at edge of lap and roll firmly into place with an approved roller.
 - c. Install additional Waterproofing Tape to cover white film that has been installed over 30 days prior.
 2. Repair of pre-applied sheet membrane
 - a. Scratch on white coating exposing underlying black surface of Sheet Membrane. Install Waterproofing Tape at areas where the white coating of the membrane is damaged, including boot scuff marks and abrasions by rebar.
 - b. Damage or Puncture of Sheet Membrane: Install Patch of short Membrane set in Liquid Membrane. Patch must extend 3 in. in every direction around extent of damaged area. Install Waterproofing Tape centered over the edge of the patch. If the damaged area does not have 5 in. of sound material around it, inject Liquid Membrane into puncture until Liquid Membrane backs out, and proceed with patch as space allows.

3.7 INSTALLATION OF PLAZA AND/OR TERRACE WATERPROOFING

- A. Apply membrane from the low point to the high point so that laps shed water. Overlap all seams at least 2". Stagger all end laps. Roll the entire membrane firmly and completely as soon as possible. Use a linoleum roller or standard water-filled garden roller less than 30" wide, weighing a minimum of 75 lbs. when filled. Cover the face of the roller with a resilient material such as a plastic foam or two wraps of indoor-outdoor carpet to allow the membrane to fully contact the primed substrate. Seal all T-joints and membrane terminations with Mastic or Liquid Membrane at the end of the day.
- B. Patch tears and inadequately lapped seams with membrane. Slit fishmouths, repair with a patch extending 6" in all directions from the slit and seal edges of the patch with Mastic. Do not apply Mastic where it will be covered with membrane, except when used as a temporary cut-off.
- C. Flood test application of waterproofing in accordance with Article 3.8 herein.



- D. After flood testing and repairs is complete, cover membrane with drainage composite board using tape and/or adhesive per manufacturer's recommendations.

3.8 WATER TEST

- A. Water tests shall be conducted for horizontal applications at Plazas and Terraces and must be judged to be successful by the Commissioner, before the installation of any subsequent components of the waterproofing system. Do not conduct water test during rain, other inclement weather, or if sections of exposed structural deck adjacent to the test area contain standing water or are wet.
- B. Water test areas of membrane that are penetrated by dowels, electrical conduit, etc. after the penetrations are installed through the membrane and flashed. Testing the penetrations may be done as part of a test of a larger area or as separate test of individual or grouped penetrations after the membrane has been successfully tested.
- C. Before beginning test, check area below membrane, and note any existing active leaking from other sources.
- D. Test for leaks by plugging drains, damming the area and filling area with min. 2 in. of water, and let stand for 24 hours.
- E. Check area below membrane for active leakage before releasing water.
- F. Drain water and mark all area where water stands (flat areas).
- G. Examine spaces below deck for signs of leakage, and walk all membrane seams watching for signs of "bubbling" or expulsion of water. Critically examine all seams in flat areas of standing water.
- H. If leakage occurs, inspect the membrane and restore or replace defective areas.
- I. Continue to water test until area being tested passes test.

END OF SECTION 07 13 26



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. INS-01 Foundation Insulation
2. INS-02 Exterior (Mineral Wool) Insulation
3. INS-03 Continuous Enclosure Wall Insulation
4. INS-04 Closed Cell Spray Foam Insulation
5. INS-05 Batt Insulation
6. Attachment devices.

- B. Related Sections

1. Section 04 20 00 "Unit Masonry"
2. Section 07 52 13 "Atactic-Polypropylene-Modified Bituminous Membrane Roofing" for roof insulation.
3. Section 07 84 00 "Firestopping"
4. Section 08 44 13 "Glazed Aluminum Curtain Walls" for curtain wall insulation.
5. Section 09 21 16 "Gypsum Board Assemblies" for acoustical insulation.

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Submit product data for each type of product indicated, including recycled content.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for insulation products.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".



- B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- C. Vertical and Lateral Fire Propagation Test Characteristics: The exterior wall assembly is required to comply with NFPA 285 "Standard Method of Test for the Evaluation of Flammability Characteristics of Exterior Nonload-bearing Wall Assemblies Containing Combustible Components." The base wall, stud cavity insulation, wall sheathing, air barrier, continuous wall rigid insulation and exterior cladding are components that are required to be evaluated as part of this specific assembly test. The basis of design product listed below is a component of the design test assembly selected by the Commissioner.

PART 2 PRODUCTS

2.1 FOUNDATION WALL INSULATION (INS-01)

- A. Provide extruded polystyrene board insulation conforming to ASTM C 578, Type IV, with a maximum flame spread and smoke developed indices of 75 and 450 respectively.
- B. Insulation shall have an aged R value of not less than 5/inch; shall be 2" thick unless otherwise noted on the drawings.
- C. Basis-of-Design Product: Subject to compliance with requirements, provide Dow Chemical Co.; Styrofoam or comparable product by one of the following:
 - 1. Owens Corning
 - 2. PACTIV Building Products
 - 3. Or approved equal.

2.2 EXTERIOR (MINERAL WOOL) INSULATION (INS-02)

- A. Unfaced, Mineral-Wool Board Insulation: ASTM C 612; with maximum flame-spread and smoke-developed indexes of 15 and zero, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
 - 1. Nominal density of 8 lb/cu. ft., Type III, thermal resistivity of 4.35 deg F x h x sq. ft./Btu x in. at 75 deg F.
 - 2. Fiber Color: Darkened, where indicated.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Owens Corning Thermafiber
 - 2. Rockwool International
 - 3. JM Insulshield
 - 4. Delta Rockwool
 - 5. Or approved equal.



2.3 CONTINUOUS ENCLOSURE WALL INSULATION (INS-03)

- A. Polyisocyanurate Board Insulation, Foil Faced: ASTM C1289, foil faced, Type I, Class 1 or 2.
 - 1. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
 - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Dow Chemical Company, The
 - b. Firestone Building Products.
 - c. Hunter Panels.
 - d. Rmax, Inc.
 - e. Or approved equal.

2.4 CLOSED CELL SPRAY FOAM INSULATION (INS-04)

- A. Spray Foam Insulation
 - 1. Manufacturers
 - a. Henry Permax RT 2045-2.0.
 - b. Dow Chemical Co. Styrofoam Spray Polyurethane Foam.
 - c. Demilec LLC Heatlok SOY 200.
 - d. BASF Corp. Walltite.
 - e. NCFI InsulStar.
 - f. Or approved equal.
 - 2. Material
 - a. Insulation: ASTM C 1029, Type II polyurethane with zero ODP.
 - b. Density (ASTM D 1622): 2.1 lbs/cu. ft.
 - 3. Accessories
 - a. Primer: As required by insulation manufacturer.
 - b. Overcoat: Aldocoat 747 Ignition Barrier Protective Coating, Aldo Products.
- B. Spray Insulation at Tight Spaces: Provide polyurethane foam insulation product to fill gaps, joints, etc. that both seals and insulates.

2.5 MINERAL-WOOL BLANKET INSULATION (INS-05)

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Rockwool.
 - 2. Thermafiber Owens Corning.
 - 3. Johns Manville
 - 4. Or approved equal.



- B. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 30 percent.
- C. Unfaced, Mineral-Wool Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
 - 1. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
- D. Reinforced-Foil-Faced, Mineral-Wool Blanket Insulation: ASTM C 665, Type III (reflective faced), Class A (faced surface with a flame-spread index of 25 or less per ASTM E 84); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim Kraft, or foil-scrim polyethylene.
 - 1. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.6 ACCESSORIES

- A. Adhesive for Bonding Insulation: The type recommended by the insulation manufacturer, and complying with fire-resistance requirements.
 - 1. For bonding rigid polystyrene insulation to masonry or concrete, provide adhesive equal to "Foamgrab PS" made by Dacor Products Co. or equal made by ChemRex Inc. or Miracle Adhesives or approved equal.
- B. Protection Board: Premolded, semi-rigid asphalt/fiber composition board, 1/4" thick, formed under heat and pressure, standard sizes.

2.7 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 one of the following:
 - a. AGM Industries, Inc.; Series T TACTOO Insul-Hangers.
 - b. Gemco; Spindle Type.
 - c. Midwestern Fasteners.
 - 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.
 - 4. Affix plate with stainless steel staple or screw.
- B. Insulation Fastening System at CMU and Concrete: Provide Ramset Insulfast system, Johns Manville, Midwestern Fasteners or approved equal mechanically fastening system.
- C. Adhesively Attached, Angle-Shaped, Spindle-Type Anchors: Angle welded to projecting spindle; capable of holding insulation of specified thickness securely in position indicated with self-locking washer in place.



1. Angle: Formed from 0.030 inch thick, perforated, galvanized carbon-steel sheet with each leg 2 inches square.
 2. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation indicated.
- D. 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. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in the following locations:
 - a. Crawl spaces.
 - b. Ceiling plenums.
 - c. Attic spaces.
 - d. Where indicated.
- E. Insulation Standoff: Spacer fabricated from galvanized mild-steel sheet for fitting over spindle of insulation anchor to maintain air space of 2 inches between face of insulation and substrate to which anchor is attached.
- F. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION, GENERAL

- A. Clean substrates of substances that are harmful to insulation including removing projections capable of puncturing vapor retarders, or that interfere with insulation attachment.
- B. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.
- C. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- D. 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.
- E. 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.



3.3 INSTALLATION OF BELOW-GRADE INSULATION

- A. On vertical surfaces, set insulation units using manufacturer's recommended adhesive according to manufacturer's written instructions.
 - 1. If not otherwise indicated, extend insulation a minimum of 24 inches below exterior grade line.
- B. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.
 - 1. If not otherwise indicated, extend insulation a minimum of 36 inches in from exterior walls.

3.4 INSTALLATION OF CAVITY-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."

3.5 INSTALLATION OF BLANKET 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 or Mineral-Wool Blanket 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. For wood-framed construction, install blankets according to ASTM C 1320 and as follows:
 - a. With faced blankets having stapling flanges, secure insulation by inset, stapling flanges to sides of framing members.
 - b. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.
 - 6. 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 as indicated on Drawings.

3.6 INSTALLATION OF SEMI-RIGID INSULATION FOR FRAMED CONSTRUCTION

- A. Install wall insulation with edges closely butted, with joints square, straight and in alignment (no staggered), and with vapor barrier facing on warm side of building, and with exposed faces flush and in the same plane without warp or twist. Cut and fit insulation to closely fit intersecting or penetrating surfaces. Seal joints between insulation, between insulation and intersecting or penetrating surfaces and between insulation and perimeter surfaces with 4" wide vaporproof aluminum tape applied on the vapor barrier side. Insulation shall be friction fit between furring channels or studs.

3.7 INSTALLATION OF BOARD INSULATION FOR CONCRETE AND CMU SUBSTRATES

- A. Install board insulation on concrete substrates by insulation fastening system specified above at fastener rate per insulation manufacturer's requirements.
 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 indicated.
 2. Apply insulation standoffs to each spindle to create cavity width indicated 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 below indicated thickness.
 4. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.

3.8 INSTALLATION OF SPRAY FOAM INSULATION

- A. Apply self-supported, spray-applied insulation according to manufacturer's written instructions. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked. After insulation is applied, make it flush with face of studs by using method recommended by insulation manufacturer.
- B. Field Quality Control. Submit spray polyurethane foam field inspection and test reports for the following:
 1. Complete the Daily Work Record and record all information required including the results of the testing. The Daily work Record shall be kept on site for routine inspection. Copies of the daily Work Record shall be forwarded to the manufacturer and Commissioner upon request.
 2. The costs incurred for daily testing and inspection and the completion of the Daily work Record shall be by the Contractor.
 3. If required by the Commissioner, arrange for site inspections by a qualified third party inspector. If the site inspection reveals any defects, the Contractor shall immediately rectify all such defects at his cost.



4. Daily work record shall verify conformance with the Thermal and Air Barrier Wall System Manufacturer's instructions, the standard ULC S705.2-02 Installation standard and this Section of the project specification.
 - a. Follow Manufacturer guidelines for proper temperature settings regarding spray equipment as stated on Manufacturer product information sheets
 - b. Follow Manufacturer guidelines for proper spray polyurethane foam formulation based on substrate and ambient temperatures product will be applied to.
 - c. Test completed application daily for core density and cohesion/adhesion to substrate. Record results daily in test reports.
 - d. After product has properly cured, conduct tests to verify adhesion between the spray polyurethane foam and the substrate.
 - e. Conduct adhesion tests on all corners and building angles, at wall-to-slab junctions, and at wall-to-roof junctions.
 - f. Perform one adhesion test for every wall less than 100 feet in length. Perform two testes for every wall greater than 100 feet and less than 200 feet in length, with an additional test conducted for every additional 100 feet, or part thereof, in wall length.
 - g. Transition membranes shall be pull tested in accordance with the Installer instruction program requirements before installing the spray polyurethane air barrier material.

3.9 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. 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. Fluid-applied membrane air barrier applied over sheathing board and cold formed metal framing.
 - 2. Materials and installation to bridge and seal the following air leakage pathways and gaps:
 - a. Connections of the walls to the roof.
 - b. Connections of the walls to the foundations.
 - c. Seismic and expansion joints.
 - d. Openings and penetrations of window frames, storefront, curtain wall.
 - e. Door frames.
 - f. Piping, conduit, duct and similar penetrations.
 - g. Masonry ties, screws, bolts and similar penetrations.
 - h. All other air leakage pathways in the building envelope.

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Submit shop drawings showing locations and extent of air barrier and details of all typical conditions, intersections with other envelope systems and materials, membrane counter-flashings, and details showing how gaps in the construction will be bridged, how inside and outside corners are negotiated and how miscellaneous penetrations such as conduits, pipes electric boxes and the like are sealed.
- C. Submit manufacturer's product data sheets, including manufacturer's printed instructions for evaluating, preparing, and treating substrate, temperature and other limitations of installation conditions, technical data, and tested physical and performance properties.
- D. Submit manufacturer's installation instructions.
- E. Submit certification of compatibility by air barrier manufacturer, listing all materials on the project that it connects to or that come in contact with it, including sealant as for caulking joints between sheathing panels.
- F. Submit samples, 8-1/2" by 11" minimum size, of air barrier material.
- G. Quality Assurance Submittals



1. Manufacturer's Field Service Reports: Provide site reports from authorized field service representative, indicating observation of air barrier assembly installation.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Installer Qualifications: Entity with a minimum of 3 years of successful experience in the installation of the specified air barrier system.
- C. Single-Source Responsibility: Obtain air barrier materials from a single manufacturer regularly engaged in manufacturing the product.
- D. Mock-Up
 1. Install mock-up using approved air barrier assembly including fasteners, flashing, tape and related accessories per manufacturer's current printed instructions and recommendations.
 - a. Mock-up size: 10 feet by 10 feet.
 - b. Mock-up Substrate: Match wall assembly construction, including window opening.
 - c. Mock-up may remain as part of the work.
 2. Contact manufacturer's designated representative prior to air barrier assembly installation, to perform required mock-up visual inspection and analysis as required for warranty.

1.5 WARRANTY

- A. Special Warranty
 1. Air barrier manufacturer's warranty for air barrier for a period of ten (10) years from date of substantial completion.
 2. Pre-installation meetings and jobsite observations by air barrier manufacturer for warranty is required prior to assembly installation.

PART 2 - PRODUCTS

2.1 GENERAL PERFORMANCE REQUIREMENTS

- A. Air-Barrier Performance: Air-barrier assembly and seals with adjacent construction shall be capable of performing as a continuous air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
- B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft., when tested in accordance with ASTM E 2357.



2.2 HIGH-BUILD AIR BARRIERS, VAPOR PERMEABLE

- A. High-Build, Vapor-Permeable Air Barrier: synthetic polymer membrane with an installed dry film thickness, in accordance with manufacturer's written instructions, of 1/8" wet film (70 mils), 35 mils dry for 21 perms vapor permanence or thicker over smooth, void-free substrates.

1. Synthetic Polymer Type

- a. Basis-of-Design Product: Subject to compliance with requirements, provide Henry Company; Air-Bloc 31MR or comparable product by one of the following:
- 1). GCP Applied Technologies Inc. (formerly Grace Construction Products).
 - 2). Carlisle Coatings & Waterproofing, Inc.
 - 3). Tremco Incorporated.
 - 4). Or approved equal.

2. Physical and Performance Properties:

- a. Air Permeance: Maximum 0.002 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E 2178.
- b. Vapor Permeance: Greater than 10 perms, 35 per above; ASTM E 96/E 96M, Water Method, Procedure B.
- c. Vapor Permeance: Record value from manufacturer; ASTM E 96/E 96M, Desiccant Method, Procedure A.
- d. Ultimate Elongation: Minimum 200 percent; ASTM D 412, Die C.
- e. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

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. Self-Adhered Flashings / Membrane Underlayment (behind gutter): Non-vapor permeable, self-adhered water resistive air and vapor barrier consisting of an SBS rubberized asphalt compound, integrally laminated to a blue engineered thermoplastic film, having the following typical properties:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Henry Company; Blueskin SA or comparable product by one of the following:
 - a. GCP Applied Technologies Inc. (formerly Grace Construction Products).
 - b. Carlisle Coatings & Waterproofing, Inc.
 - c. Tremco Incorporated.
 - d. Or approved equal.



PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 SURFACE PREPARATION

- A. Clean, prepare, treat, fill, and seal substrate and joints and cracks in substrate in accordance with 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 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 in concrete with substrate-patching material.
- E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- F. 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.
- G. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

3.3 ACCESSORIES INSTALLATION

- A. Install accessory materials in accordance with air-barrier manufacturer's written instructions and details to form a seal with adjacent construction and ensure continuity of air and water barrier.
 - 1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
 - 2. Install transition strip on roofing membrane or base flashing so that a minimum of 3 inches of coverage is achieved over each substrate.
 - 3. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
 - 4. 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. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.
- D. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- E. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip or preformed silicone extrusion 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.
 - 1. Transition Strip: Roll firmly to enhance adhesion.
 - 2. Preformed Silicone Extrusion: Set in full bed of silicone sealant applied to walls, frame, and air-barrier material.
- F. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air-barrier material with foam sealant.
- G. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.
- H. Seal top of through-wall flashings to air barrier with an additional 6-inch-wide, transition strip.
- I. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
- J. Repair 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 repaired areas in strip direction.

3.4 PRIMARY AIR-BARRIER MATERIAL INSTALLATION

- A. Apply air-barrier material to form a seal with strips and transition strips and to achieve a continuous air barrier in accordance with air-barrier manufacturer's written instructions and details. Apply air-barrier material within manufacturer's recommended application temperature ranges.
 - 1. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
 - 2. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
 - 3. Where multiple prime coats are needed to achieve required bond, allow adequate drying time between coats.
- B. High-Build Air Barriers: Apply continuous unbroken air-barrier material to substrates in accordance with the following thickness. Apply air-barrier material in full contact around protrusions such as masonry ties.
 - 1. Vapor-Permeable, High-Build Air Barrier: Total dry film thickness as recommended in writing by manufacturer to comply with performance requirements, but not less than 35 mils, applied in one or more equal coats.
- C. Do not cover air barrier until it has been tested and inspected by testing agency.



- D. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.5 FIELD QUALITY CONTROL

- A. Notify manufacturer's designated representative to obtain required periodic observations of air barrier assembly installation.
- B. Final Observation and Verification:
 - 1. Final inspection of air barrier assembly shall be carried out by the Contractor and Air Barrier Manufacturer as required by warranty.

3.6 CLEANING AND PROTECTION

- A. Protect air-barrier system from damage during application and remainder of construction period, in accordance with manufacturer's written instructions.
 - 1. Protect air barrier from exposure to UV light and harmful weather exposure as recommended in writing by manufacturer. If exposed to these conditions for longer than recommended, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed materials in accordance with air-barrier manufacturer's written instructions.
 - 2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.
- B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended in writing by manufacturer of affected construction.
- C. Remove masking materials after installation.

END OF SECTION 07 27 26



SECTION 07 42 13 - 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. Preformed aluminum composite metal wall panels.
 - 2. Preformed trim pieces and accessory moldings.
 - 3. All necessary seals and gaskets to weather-seal all exterior panel to panel joints.
 - 4. Supports for panels.
- B. Related Sections
 - 1. Section 05 31 00 "Steel Decking"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Submit complete and detailed shop drawings, calculations indicating conformance with load and performance requirements, anchorage to structure, product data, and installation instructions prior to start of any fabrication. Drawings shall include all field dimensions, and shall indicate interface with windows set in metal cladding panels.
- C. Indicate dimensions, panel profile, panel layout, construction details, method of anchorage, and any other details as required for the specific installation.
- D. Submit 24" x 24" mock-up of each type of metal panel.
- E. Submit to Commissioner manufacturer's 12" x 12" color samples and finish samples for each panel type.
- F. Deflection Engineering Services: Provide calculations, certified by a registered professional engineer, licensed in the State of New York, shall be submitted to verify load carrying capability of panel system.
- G. Submit certification that systems meet performance standards.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".



- B. The Contractor, by commencing the work of this Section, assumes overall responsibility, as part of his 1 year guarantee of the work, to ensure that all assemblies, components and parts shown or required comply with the Contract Documents. The Contractor shall further guarantee:
 - 1. That all components, specified or required to satisfactorily complete the installation, are compatible with each other and with the conditions of installation and expected use.
 - 2. The overall effective integration and correctness of individual parts and the whole of the system.
 - 3. Compatibility with adjoining substrates, materials and work of other trades.
 - 4. There shall be no premature material failure due to improper design and fabrication.
- C. Field measurements shall be taken prior to the completion of shop fabrication.
- D. Vertical and Lateral Fire Propagation Test Characteristics: The exterior wall assembly is required to comply with NFPA 285 "Standard Method of Test for the Evaluation of Flammability Characteristics of Exterior Nonload-bearing Wall Assemblies Containing Combustible Components." The base wall, stud cavity insulation, wall sheathing, air barrier, continuous wall rigid insulation and exterior cladding are components that are required to be evaluated as part of this specific assembly test. The basis of design product listed below is a component of the design test assembly selected by the Commissioner.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protect panels and accessories during storage and construction against moisture, staining and physical damage.
- B. Store panels under cover in a dry and clean location, off the ground. Do not store panels face down or in contact with earth or damaging foreign materials. Store panels with appropriate separating materials to prevent scratching, denting or abrading any panel surface.

1.6 JOB CONDITIONS

- A. Review installation procedures and coordination with other work, with other trades whose work will be affected by work of this Section.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Protection: Materials shall be packed, unloaded, stored and protected to avoid abuse, damage and defacement from any source in accord with the recommendations contained in the AAMA Aluminum Curtain Wall Manual #10, "Care and Maintenance of Architectural Aluminum."

1.8 WARRANTY

- A. Furnish manufacturer's ten year warranty on materials and workmanship.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Provide "Alucobond Plus" composite aluminum panels as manufactured by Alusuisse Composite Inc., or equal by Mitsubishi, Kasei, or approved equal.



1. Panel Thickness: 6 mm.

2.2 PANEL FABRICATION

- A. Composition: Two sheets of aluminum sandwiching a solid core of mineral wool material formed in a continuous process with no glues or adhesives between dissimilar materials. The core material shall be free of voids and/or air spaces and not contain foamed insulation material. Products laminated sheet by sheet in a batch process using glues or adhesives between materials shall not be acceptable.
- B. Aluminum Face Sheets
 1. Thickness: 0.5 mm.
 2. Alloy
 - a. AA3000 Series (Painted material)
 - b. AA5000 Series (Anodized material)
- C. Panel Thickness: 6 mm.
- D. Tolerances
 1. Panel Bow: Maximum 0.8% of any 72" panel dimension.
 2. Panel Dimensions: Field fabrication shall be allowed where necessary, but shall be kept to an absolute minimum. All fabrication shall be done under controlled shop conditions when possible.
 3. Panel lines, breaks, and angles shall be sharp, true, and surfaces free from warp and buckle.
 4. Maximum deviation from panel flatness shall be 1/8" in 5'-0" on panel in any direction for assembled units. (Non-accumulative – No Oil Canning).
- E. System Characteristics
 1. Plans, elevations, details, characteristics, and other requirements indicated are based upon standards by one manufacturer. It is intended that other manufacturers, receiving prior approval, may be acceptable, provided their details and characteristics comply with size and profile requirements, and material/performance standards.
 2. System must not generally have any visible fasteners, telegraphing or fastening on the panel faces or any other compromise of a neat and flat appearance.
 3. System shall comply with the applicable provisions of the "Metal Curtain Wall, Window, Storefront, and Entrance Guide Specifications Manual" by AAMA and ANSI/AAMA 302.9 requirements for aluminum windows.
 4. Fabricate panel system to dimension, size, and profile indicated on the drawings based on a design temperature of 70 deg. F.
 5. Fabricate panel system so that no restraints can be placed on the panel, which might result in compressive skin stresses. The installation detailing shall be such that the panels remain flat regardless of temperature change and at all times remain air and water tight.



6. The finish side of the panel shall have a removable plastic masking applied prior to fabrication, which shall remain on the panel during fabrication, shipping, and erection to protect the surface from damage.

F. System Type

1. Rout and Return Dry

- a. System must provide a perimeter aluminum extrusion with integral weather-stripping as detailed on drawings.
- b. No field sealant required in joints unless specifically noted on drawings.

G. System Performance

1. Composite panels shall be capable of withstanding building movements and weather exposures based on the following test standards required by the Commissioner and/or the New York City Building Code.

a. Wind Load

- 1). If system tests are not available, mock-ups shall be constructed and tests performed under the direction of an independent third party laboratory, which show compliance to the following minimum standards:
- 2). Panels shall be designed to withstand the Design Wind Load based upon the New York City Building Code, but in no case less than 30 lb/ft². Wind load testing shall be conducted in accordance with ASTM E 330 to obtain the following results:
 - (a). Normal to the plane of the wall between supports, deflection of the secured perimeter-framing members shall not exceed L/175 or 3/4", whichever is less.
 - (b). Normal to the plane of the wall, the maximum panel deflection shall not exceed L/60 of the full span.
 - (c). Maximum anchor deflection shall not exceed 1/16".
 - (d). At 1-1/2 times design pressure, permanent deflections of framing members shall not exceed L/100 of span length and components shall not experience failure or gross permanent distortion. At connection points of framing members to anchors, permanent set shall not exceed 1/16".

b. Air/Water System Test

- 1). If system tests are not available, mock-ups shall be constructed and tests performed under the direction of an independent third party laboratory, which show compliance to the following minimum standards:
 - (a). Air Infiltration – Where tested in accordance with ASTM E 283, air infiltration at 1.57 lb/ft² must not exceed 0.06 ft³ min. per ft² of wall area.
 - (b). Water Infiltration – Water infiltration is defined as uncontrolled water leakage through the exterior face of the assembly. Systems shall be designed to drain any water leakage occurring at the joints. No water infiltration shall occur in any system under a differential static pressure of 6.24 lb/ft² after 15 minutes of exposure in accordance with ASTM E 331.

2. Bond Integrity: When tested for bond integrity, in accordance with ASTM D 1781 (simulating resistance to panel delamination), there shall be no adhesive failure of the bond a) between the core and the skin nor b) cohesive failure of the core itself below the following values:

- a. Peel Strength: 22.5 in lb/in as manufacturer
22.5 in lb/in after 21 days soaking in water at 70 deg. F.



3. Fire Performance

- a. ASTM E 84 Max. Flame Spread 25, Max. Smoke Developed 450
- b. NFPA 285 Panels shall meet requirements of the Intermediate Scale Multi Story Test

2.3 FINISH OF ALUMINUM

- A. High-Performance Organic Finish, Two-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat.
 - 1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 2. Custom color and gloss as selected by the Commissioner.

2.4 ACCESSORIES

- A. Extrusions, formed members, trim, sheet, and plate shall conform with ASTM B 209 and the recommendations of the manufacturer.
- B. Panel stiffeners, if required, shall be structurally fastened or restrained at the ends and shall be secured to the rear face of the composite panel with silicone of sufficient size and strength to maintain panel flatness. Stiffener material and/or finish shall be compatible with the silicone.
- C. Gaskets within the panel system shall be as per manufacturer's standards to meet performance requirements.
- D. Fabricate flashing materials from 0.030" minimum thickness aluminum sheet painted to match the adjacent panel system where exposed. Provide a lap strap under the flashing at abutted conditions and seal lapped surfaces with a full bed of non-hardening sealant meeting requirements of Section 07 92 00 "Joint Sealers".
- E. Fasteners: Non-corrosive fasteners as recommended by panel manufacturer. Do not expose fasteners.
 - 1. Fasteners shall be secure to cold formed metal framing, not sheathing.
- F. Attachment system shall allow for the free and noiseless vertical and horizontal thermal movement due to expansion and contraction for a material temperature range of -20 deg. F to +180 deg. F. Buckling of panels, opening of joints, undue stress on fasteners, failure of sealants or any other detrimental effects due to thermal movement will not be permitted.
- G. Do not cut, trim, weld, or braze component parts during erection. Return component parts which require alteration to shop for refabrication, or for replacement with new parts.
- H. Separate dissimilar metals and use gasketed fasteners where needed to eliminate the possibility of corrosive or electrolytic action between metals.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.



3.2 INSTALLATION OF WALL PANELS

- A. Install panels and related components in strict accordance with manufacturer's instructions and approved shop drawings. Installation shall be performed under experienced supervision authorized by the manufacturer.
- B. All supports and fastenings shall be protected against corrosion and the effects of moisture.
- C. Each unit shall be accurately and securely erected, lined up with relations to adjoining parts, with all joints plumb, level and true within the limits as set by the flatness of the panels and the general contour of the building.
- D. Dented, sprung, bent, chipped or otherwise face damaged units will not be accepted and, if erected must be replaced by undamaged units at no additional cost to the City of New York.
- E. Installation Tolerances: Align panels within 1/8" of 20'-0" on level/plumb and location. Hold surface plane of adjacent panel within 1/32" tolerance.
- F. The work shall be designed to accommodate all tolerances and anticipate dead and live load movement, creep, sway and torsion of the structure without any harmful effects.

3.3 ADJUSTING AND CLEANING

- A. Remove and replace panels damaged as a direct result of the panel installation.
- B. Remove masking as directed by the Commissioner. After removal, clean panels to the satisfaction of the Commissioner.
- C. Make sure drainage channels are unobstructed and free of dirt and sealants.

END OF SECTION 07 42 13



SECTION 07 52 13 - ATACTIC-POLYPROPYLENE-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. Atactic-Polypropylene (APP) modified bitumen roof membrane.
 - 2. Roof insulation.
 - 3. Base flashing.
 - 4. Accessories.
- B. Related Sections
 - 1. Section 02 41 19 "Selective Demolition"
 - 2. Section 06 10 00 "Rough Carpentry" for wood blocking.
 - 3. Section 07 62 00 "Sheet Metal Flashing and Trim"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: Submit manufacturer's technical product data, installation instructions and recommendations for each type of roofing product required. Include data substantiating that materials comply with requirements.
- C. Pre-Roofing Conference: Submit copies of pre-roofing conference records.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Manufacturer Qualifications: Obtain primary roofing products, including roofing sheets (felts), bitumen, composition flashings, and vapor barrier from a single manufacturer. Provide secondary materials as recommended by manufacturer of primary materials.
- C. Installer Qualifications: An entity meeting the requirements of the DDC General Conditions Section 014000 "Quality Requirements," Article 1.7.C.3.



- D. **Pre-Roofing Conference:** Prior to installation of roofing and associated work, meet at project site, or other mutually agreed location, with Installer, roofing manufacturer, installers of related work, Contractor and other entities concerned with roofing performance, including the Commissioner and the City of New York. Record discussions and agreements and furnish copy to each participant. Provide at least seventy-two (72) hours' advance notice to participants prior to convening pre-roofing conference. Review methods and procedures related to roofing work, including but not limited to the following:
1. 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.
 2. Review roofing system requirements (drawings, specifications and other Contract Documents.
 3. Review required submittals, both completed and yet to be completed.
 4. 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.
 5. Review required inspection, testing, certifying and material usage accounting procedures.
 6. Review weather and forecasted weather conditions, and procedures for coping with unfavorable conditions, including possibility of temporary roofing (if not a mandatory requirement).
- E. **UL Listing:** Provide labeled materials which have been tested and listed by UL in "Building Materials Directory" for application indicated, with "Class A" rated materials/system for roof slopes shown.
1. Provide roof covering materials bearing Classification Marking (UL) on bundle, package or container indicating that materials have been produced under UL's Classification and follow-up Service.
- F. **Fire Performance Characteristics:** Provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to the Commissioner:
1. Surface Burning Characteristics: ASTM E 84.
 2. Fire Resistance Rating: ASTM E 119.
 3. Combustibility Characteristics: ASTM E 136.
- G. Provide roofing system and component materials which have been evaluated by Factory Mutual System for fire spread, wind-uplift Class 90, and hail damage and are listed in "Factory Mutual Approval Guide" for Class I construction. System shall also meet ASCE-7 for wind uplift standards.
1. Provide roof covering materials bearing FM approval marking on bundle, package or container, indicating that material has been subjected to FM's examination and follow-up inspection service.

1.5 JOB CONDITIONS

- A. **Weather Condition Limitations:** Proceed with roofing work only when existing and forecasted weather conditions will permit work to be performed in accordance with manufacturer's recommendations and warranty requirements.



1.6 PRODUCT HANDLING

- A. Store and handle roofing sheets in a manner which will ensure that there is no possibility of significant moisture pick-up.
- B. Store in a dry, well ventilated, weather-tight place. Unless protected from weather or other moisture sources, do not leave unused felts on the roof overnight or when roofing work is not in progress. Store rolls of felt and other sheet materials on end on pallets or other raised surface. Handle and store materials or equipment in a manner to avoid significant or permanent deflection of deck.

1.7 WARRANTY

- A. Current warranty must be maintained/renewed after adjustments are made to the roofing under this contract.
- B. Project Warranty: Provide written warranty, signed by Manufacturer of primary roofing materials and his authorized Installer, agreeing to replace/repair defective materials and workmanship as required to maintain roofing system in watertight condition.
- C. Warranty period for manufacturer is twenty (20) years after date of Substantial Completion; no dollar limit.
- D. Guarantee period for installer is two (2) years after date of Substantial Completion; no dollar limit.

PART 2 PRODUCTS

2.1 ROOFING SYSTEM

- A. Roofing system to be a multiple layer, APP modified bitumen (polyester reinforced), granule surfaced, equal to GTA-FR-C-B3, CertainTeed Flintastic GTA-FR with CoolStar, or approved equal by Johns Manville, Siplast or approved equal.

2.2 ROOF INSULATION

- A. Polyisocyanurate Board Roof Insulation: Rigid, sloped (1/8" per foot) and flat, cellular thermal insulation with polyisocyanurate closed-cell foam core and manufacturer's standard facing laminated to both sides; complying with ASTM C 1289, average LTTR value as designated at mean temperatures indicated, after testing per ASTM C 1303 as follows:
 - 1. Surface Burning Characteristics: Maximum flame spread of 25.
 - 2. LTTR R-Value: 6.0/inch at 75 deg. F.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide Johns Manville; Enrgy 3 or comparable product by one of the following:
 - 1. Apache
 - 2. Hunter
 - 3. Or approved equal.
- C. Roof membrane manufacturer must approve insulation in writing.



- D. Cover insulation with 3/4" thick Perlite board equal to "Fesco" as manufactured by Johns Manville, or comparable product by Apache, Hunter or approved equal.

2.3 MODIFIED BITUMINOUS BASE FLASHING

- A. Provide modified bituminous base flashing system as determined by edge details and that is acceptable to roofing manufacturer.

2.4 CANT STRIPS

- A. Provide cant strips formed of rigid insulation matching roof insulation or molded asphalt or coal tar impregnated organic fiber insulation material, 45 degree cant, unless otherwise indicated.

2.5 MISCELLANEOUS MATERIALS

- A. Lead flashing sheet of 4 lb. flashing lead for pipe flashing of common desilverized pig lead.
- B. FM approved mechanical fasteners for attaching insulation to deck.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 REMOVAL OF EXISTING ROOFING

- A. Removal of existing roofing consists of removal of entire roof system including roof membrane, insulation, base flashing, cap flashings and all metal flashings associated with roof construction.
- B. All work shall conform to the requirements of Section 02 41 19, Selective Demolition and Alteration Work.
- C. Provide all required covers and protective devices as necessary to keep water from penetrating into the structure due to roof removal. Be responsible for any damage caused by lack of such protection.
- D. Clean existing concrete deck prior to installation of new roof system so that it meets with the approval of roof membrane manufacturer. Obtain such approval in writing and submit copy of same to the Commissioner.

3.3 INSTALLATION, GENERAL

- A. Install built-up roofing in accordance with manufacturer's recommendations and New York City Building Code.
- B. Substrate shall be clean, smooth and dry, free of projections which might puncture the felts.
- C. Ensure that all drains, curbs, blocking and roof penetrating components are in place before any roofing work starts. See that all roof drains are set 1" below the normal finish roof level to ensure that additional flashing around the drains will not be built-up above the normal roof level and prevent proper drainage.
- D. Install flashing, including counterflashing, as roof application progresses. If delay is unavoidable, trowel the top of the flashing with flashing cement close to the joint to prevent water from entering behind the flashing until the counterflashing is in place.



- E. Start roofing application at far points of the deck and work toward area where base materials are fastened to the roof deck (to minimize traffic over newly applied roofing).
- F. Weigh down all membrane edges left incomplete before splicing with other sections of membrane.
- G. Prohibit phased application in which saturated felts are left exposed overnight or longer before top plies and topcoat are applied. Place aggregate surface on same day as felts.
- H. Inspect roof drains for obstructions and debris after the roofing work is completed.
- I. Prime deck as recommended by roof membrane manufacturer.

3.4 INSULATION

- A. Extend insulation and cover board full thickness over entire surface to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation and mastic.
- B. Apply a double layer of insulation of the required thickness, to make up the total thickness. Stagger joints between layers as recommended by the manufacturer.
- C. Set first layer of insulation using mechanical fasteners spaced in accordance with FM requirements to meet I-90 wind uplift. Apply second layer of insulation cold fluid-applied adhesive.
- D. Do not advance the laying of insulation ahead of roofing more than necessary for sequence of operations. Cover insulation exposed at end of each day's work (and when rain threatens) with waterproofing materials. Do not permit insulation to become wet. Remove and dispose of insulation which has become wet; replace before proceeding with roofing work.
- E. Lay with edges in moderate contact but do not force into place.
- F. Stagger end joints; or tape joints where recommended by the manufacturer.
- G. Install temporary water cut-offs at completion of each day's work and remove upon resumption of work.

3.5 ROOFING

- A. Shingling of Plies: Lay plied bituminous membranes over insulation with felts shingled uniformly to achieve the required plies in accordance with manufacturer's instructions.
- B. Set on Accessories: Where small roof accessories are set on built-up roofing membrane, set metal flanges in a bed of roofing cement, and seal penetration of membrane with bead of roofing cement to prevent flow of bitumen from membrane.

3.6 COMPOSITION FLASHING AND STRIPPING

- A. Provide composition flashing at cant strips and other sloping and vertical surfaces, and at roof edges, and at penetrations through roof. Nail or provide other forms of mechanical anchorage of composition flashing to vertical surfaces, as recommended by manufacturer of primary roofing materials. Except where concealed by elastic flashing, apply a heavy coating of roofing cement over composition flashing.



3.7 ROOF DRAINS

- A. Install 1-1/2" x 18" tapered edge strips to form a gradually tapered sump transition from top of insulation to roof drain flange. Minimum sump size to be 4 ft. by 4 ft.
- B. Install roofing plies, starting at the low point (roof drain) in a shingle fashion so that four plies are provided, trimming felt plies at edge of drain flange.
- C. Install a 4# lead flashing (minimum size 30" x 30"), set in bed of flashing cement, on top of roofing plies. Form lead to shape of sump and into drain bowl, trimming neatly approx. 1" beyond ring. Install clamping ring immediately.
- D. Strip in lead with one ply of modified bitumen membrane, extending from clamping ring out a minimum of 6" beyond lead; using modified bitumen trowel grade flashing cement.

3.8 CLEANING UP

- A. Take special care to prevent splashing adhesive onto adjacent surfaces, and immediately remove all traces of such splashed and/or spilled material.

END OF SECTION 07 52 13



SECTION 07 56 00 - FLUID-APPLIED 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. Cold-fluid-applied polyurethane roofing system and related components as specified herein.
 - a. Roof membrane
 - 2. Substrate preparation.

- B. Related Sections

- 1. Section 03 30 00 "Cast-in-Place Concrete"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Shop Drawings: Submit shop drawings showing typical installation details, details at drains, at reinforcing flashing, at terminations, at joints in structure below, at intersection of horizontal and vertical surfaces, and at penetrations in membrane systems.
- C. Samples
 - 1. Fluid applied membrane, cured samples.
 - 2. Flashing material, 12" x 12".
- D. Manufacturer's Literature: Submit manufacturer's technical and installation literature for all materials of this Section.
- E. Submit certification from the manufacturer showing full time quality control of rubberized asphalt production facilities and that each batch is tested to ensure conformance with published physical properties.
- F. Submit certification from membrane manufacturer that all components of roof assembly are compatible and will be covered by the single source warranty.
- G. VOC Certification: Manufacturer's certification that all roofing/waterproofing system products meet current Volatile Organic Compound (VOC) regulations as established by the State in which they are being



installed; and stating total VOC content, in grams per liter, for all system components (i.e. primers, adhesives, coatings, etc.).

- H. Submit certification indicating that wind uplift requirements have been met as described herein.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Installer Qualifications: An entity meeting the requirements of the DDC General Conditions Section 014000 "Quality Requirements," Article 1.7.C.3.

1.5 PRODUCT HANDLING

- A. Deliver material in original unopened containers or packaging clearly labeled with manufacturer's name, brand name, instruction for use, all identifying numbers, and UL labels.
- B. Materials shall be stored in a neat, safe manner, not to exceed the allowable structural capacity of the storage area.
- C. Store materials in a clean, dry area protected from water and direct sunlight.
- D. Store all adhesives at temperatures between 60 degrees F. and 80 degrees F. If exposed to lower temperatures, restore materials to 60 degrees F. minimum temperature before using.
- E. Do not use materials damaged in handling or storage.

1.6 JOB CONDITIONS

- A. Application of the membrane shall not commence nor proceed during inclement weather. All surfaces to receive the membrane shall be free of water, dew, frost, snow and ice.
- B. Application of membrane shall not commence nor proceed when the ambient temperature is below 0 degrees F.
- C. Preparation and application of membrane must be conducted in well ventilated areas.
- D. Over its service life, do not expose membrane or accessories to a constant temperature in excess of 180 degrees F. (i.e. hot pipes and vents or direct steam venting, etc.)
- E. Adhesives contain petroleum distillates and are extremely flammable. Do not breathe vapors or use near an open fire. Do not use in confined areas without adequate ventilation. Consult container or packaging labels and Material Safety Data Sheets (MSDS) for specific safety information.

1.7 WARRANTY

- A. Single Source Warranty: Provide manufacturer's membrane material and labor warranty with no monetary limit. Warranty shall be for the following duration in accordance with the specified system:
 - 1. Warranty Period: 20 years from date of Substantial Completion.



- B. Provide a single source, 20-year Watertight Warranty covering every component in the system. The warranty shall cover leaks due to both material and workmanship problems as follows:
 - 1. The roof membrane and flashing will remain watertight for 20 years.
 - 2. All components of roof system, including membrane, flashing and workmanship will be covered under the warranty.
 - 3. In the event that the roof fails to so perform, manufacturer/supplier will make repairs to the roof system to enable it to perform as warranted.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Sika Corporation; Sikalastic RoofPro 20 system or comparable product by one of the following:
 - 1. Soprema
 - 2. Siplast
 - 3. Or approved equal.
- B. Roofing System
 - 1. Fluid-Applied Membrane System
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Sika Corporation; Sikalastic RoofPro 20 with Sika 140 Fleece or comparable product by one of the following:
 - 1). Soprema
 - 2). Siplast
 - 3). Or approved equal.
 - 2. Resin Layer
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Sika Corporation; Sikalastic 621TC/641, 80 mils wet film thickness; 20 sf/gal coverage rate approx. or comparable product by one of the following:
 - 1). Soprema
 - 2). Siplast
 - 3). Or approved equal.

2.2 MATERIALS

- A. Vapor Barrier: Self-adhering polyethylene vapor barrier with rubberized SBS adhesive backing and silicone
- B. Fleece Reinforcement: Non-woven, needle-punched polyester fleece.



- C. Top Coat: Single component, cold-fluid applied, moisture triggered, aliphatic, polyurethane top coat membrane.
- D. Sealant: One-component, polyurethane sealant that meets or exceeds ASTM C920, Type S, Grade NS, Class 12.5.
- E. Primer: Single component, rapid curing, high solids, moisture cured primer designed for sealing cementitious substrates.
- F. Concrete Repair and Patching: Cementitious repair mortar to repair bug holes, spalled areas, and other non-structural surface defects, to fill uneven areas and birdbaths, or to repitch decks shall be a two component, polymer-modified, Portland cement, fast-setting, trowel-grade mortar.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 SURFACE PREPARATION

- A. Verify that the deck is clean and smooth, free of depressions, waves, or projections, and properly sloped to drains, valleys, eaves, scuppers or gutters. Verify that all roof openings or penetrations through the roof are secured back to solid blocking. Ensure all preparatory Work is complete prior to applying membrane.
- B. Mechanical fasteners used to secure sheathing boards or penetrate sheathing boards shall be set flush with sheathing and fastened into solid backing.
- C. All surfaces shall be blown clean using an air compressor to remove any remaining loose debris.
- D. All cracks and voids greater than 0.040 inches shall be routed and caulked with a polyurethane sealant. Allow to cure per roof /waterproofing membrane manufacturer's technical data sheets prior to over-coating with the specified roof /waterproofing membrane system.
- E. At all inside corners, gaps or voids at the juncture of the deck and penetrations apply a minimum 3/4 inch fillet bead of polyurethane sealant and allow to cure per roof /waterproofing membrane manufacturer's technical data sheets prior to installing the roof /waterproofing membrane system.
- F. At all moving cracks, moving joints between dissimilar materials, and similar conditions, create a minimum 1 inch wide bond break utilizing bond breaker tape, centered over the crack or joint.
- G. Membrane terminations shall be established prior to project start-up and documented in shop drawings. Terminations shall occur in raked-out mortar joints, saw cut terminations or under installed counter-flashing materials.
- H. Use tape lines to achieve a straight edge detail.

3.3 SUBSTRATE PREPARATION

- A. Concrete Deck



1. Acceptable concrete substrates are limited to poured in place concrete decks.
2. Minimum deck thickness for structural concrete is 4 inches.
3. Concrete surface to be light broom finish.
4. Curing agents shall be checked for compatibility with specified roofing/waterproofing materials. Most curing agents shall be completely removed from the substrate by grinding, scarifying, or other mechanical means.
5. Concrete and masonry surfaces shall be low-pressure (5,000 psi or less) power-washed in accordance with ICRI Guideline No. 03732: Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays to remove all dirt, debris or surface contamination that would compromise bonding of the specified roofing/waterproofing membrane system. Remove oil or grease with solvents, or detergent and water. Rinse surface clean of remaining cleaning agents.

3.4 PRIMING

- A. Mix and apply specified primer for concrete surfaces by brush or roller at the application rate shown on the technical data sheet. Porous, rough or absorbent surfaces will decrease coverage rates.
- B. Allow to cure and dry in accordance with manufacturer's technical data sheets.

3.5 MEMBRANE REINFORCEMENT

- A. For all locations where the specified membrane system is to be applied directly to the substrate surface, provide reinforcement of cracks and joints prior to applying the specified membrane system
- B. For all moving cracks and joints, create a minimum 1 inch wide bond break centered over the crack or joint by applying bond break tape centered over each crack or joint.
- C. For all non-moving cracks and joints, rout and seal with polyurethane sealant.
- D. For all horizontal-to-vertical transitions, provide a 3/4" x 3/4" polyurethane sealant cant.
- E. Apply a minimum of a 3 inch wide strip of membrane reinforcement into a bed of liquid roofing/waterproofing membrane. Back roll reinforcement to fully embed reinforcement into the wet liquid polyurethane membrane. Add more liquid membrane as needed to fully embed the reinforcement.
- F. Ensure reinforcement is not in tension during embedment.

3.6 COLD FLUID APPLIED MEMBRANE APPLICATION

- A. Install roofing/waterproofing membrane system in accordance with current technical data sheets and in accordance with Part 2 Section 2.2.
- B. Apply base embedment coat to horizontal deck and vertical wall surfaces by brush or with 1/2 inch to 3/4 inch nap roller to achieve a continuous and uniform minimum wet film thicknesses as specified in Part 2 Section 2.2. For fleece application, approximately 2/3 of the total resin shall be applied as the base embedment coat.



- C. Immediately lay specified conformable membrane reinforcement into the wet base embedment coat. Fleece reinforcement is typically precut at flashings only before application.
- D. Apply pressure to the membrane reinforcement with a roller as appropriate to fully embed and saturate the membrane reinforcement into liquid roofing/waterproofing material. Remove air pockets from under the membrane by rolling them out.
- E. Apply additional liquid material as required to ensure the membrane reinforcement is fully embedded and has conformed to the substrate without tenting or visible pinholes.
- F. Overlap sheets of fleece membrane reinforcement a minimum of 3 inches at side laps and 6 inches at end laps.
- G. Extend membrane reinforcement vertically at adjacent wall surfaces in accordance with project details and specifications.
- H. When using fiberglass mat reinforcement, allow the base embedment coat to fully cure dry prior to the placement of top coat or other applications of the specified roofing/waterproofing material.
- I. When using polyester fleece reinforcement, immediately apply the resin top coat wet-on-wet.
- J. Apply top coat by nap roller or brush to achieve a continuous and uniform minimum wet film thickness as specified in Part 2 Section 2.2.
- K. Install all flashings in accordance with manufacturer's construction details.

3.7 PARAPET AND WALL FLASHINGS

- A. Clean, prepare and prime flashing substrate surfaces ready to receive membrane flashing applications.
- B. All parapet, wall, and curb flashings shall be provided with a sealant cant with tape reinforcement prior to flashing application.
- C. Terminate roofing/waterproofing membrane system at raked-out mortar joints, termination saw cut joint, or under installed counter-flashing materials. Seal all mortar joints and saw cut joints with polyurethane sealant.
- D. Install metal counter flashings in accordance with details.

3.8 DRIP EDGES AND OTHER METAL-FLANGED FLASHING

- A. Clean, prepare and prime metal flange surfaces ready to receive membrane flashing applications.
- B. Metal flanges are typically encapsulated between two membrane layers, usually by providing membrane flashing as a stripping ply over the metal flange, with the field or flashing membrane extending beneath the metal flange. It is also acceptable to install the stripping ply under the metal flange, and extend the field or flashing membrane over the metal flange.
- C. For insulated roof assemblies, metal flanges shall be mechanically fastened through the first membrane layer to wood nailers. For direct to substrate membrane applications where the roof / waterproofing membrane is



applied directly to the structural deck, metal flanges shall be mechanically fastened through the first membrane layer to the structural deck.

3.9 APPLICATION OF SEALANT

- A. Seal reglet-based membrane terminations, heads of exposed mechanical fasteners, around penetrations, duct work, electrical and other apparatus extending through the roofing/waterproofing membrane with specified penetration sealant.

3.10 VERIFICATION OF MEMBRANE INTEGRITY

- A. After installing horizontal membrane and before placing overburden, verify installed membrane is waterproof. Provide testing to verify membrane is free of any holes, open seams and capillary defects that will allow water to pass.
 - 1. Installation of EFVM impulse conductor wire around perimeter of area to be tested. The testing agency will determine size and shape of area. Areas will typically range between 2000 SF and 7,500 SF. The conductor wire will consist of braided polyethylene (1.5 mm diameter) interwoven with a minimum of nine (9) strands of stainless steel wire. The conductor wire will have a tensile strength of not less than 180 lbs.
 - 2. Place conductor wire 4 inches from perimeter and secure against accidental movement or damage. Place so not to create a tripping hazard. Place wire directly on membrane.
 - 3. Isolate all metal items contacting the membrane by placing isolation strands of conductor wire to isolate the field or by removing the metal items temporarily if possible.
 - 4. Isolate field of membrane from contact with grounded soil or structure contacting the membrane by placing isolation strands of conductor wire to isolate the field.
 - 5. Wet the test area with potable water sufficiently to create a continuous conducting "plate" above the membrane.
 - 6. Attach EFVM impulse generator to conductor wire with removable connectors and to ground or building structure creating a potential circuit. (The circuit will complete if water finds a path to ground by way of a breach in membrane.)
 - 7. Deliver a one second long 40 volt potential electrical impulse to the conductor wire at an average rate of one impulse every three seconds.
 - 8. Utilizing a EFVM potentiometer and two probes placed at the surface of the membrane detect the presence or absence of electrical flow across the surface to the membrane.
 - 9. If there is no flow detected after a systematic search then the certified inspector shall report the installed membrane in that area tested free of holes, seam and capillary defects and is therefore waterproof at that time.
 - 10. If there is flow detected during the search then the certified inspector shall work to identify the source of electricity and therefore the breach in the membrane. The technician shall report to the waterproofing contractor immediately if possible the exact location of any defects on the installed membrane in that area tested.



11. Defects found shall be repaired and retested.
12. The technician providing the EFVM testing shall provide a report of each day's test results containing a written description and photograph of all defects and any corrections made and a schematic CAD drawing indicating location of stationary conductor wire and of any defects found in testing to within 1 inch of accuracy. Submit report.

3.11 ROOF PROTECTION

- A. Protect roofing/waterproofing Work from other trades until completion.
- B. Stage materials in such a manner that avoids foot traffic over completed roof areas.
- C. Provide temporary walkways and platforms to protect completed Work from traffic and point loading during the application process.
- D. Provide temporary membrane tie-ins and water-stops at the end of each workday and remove prior to commencement of Work the following day.

3.12 JOB COMPLETION

- A. Contractor shall inspect the completed system and correct all defects.
- B. Clean up all debris and equipment.

END OF SECTION 07 56 00



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. Stainless steel cap metal flashing.
 - 2. Stainless steel through-wall flashing.
 - 3. Field fabricating (including bending, cutting, soldering, etc.), if required, of stainless steel flashing.
 - 4. Stainless steel flashing elsewhere, where metal flashing is indicated on drawings.
 - 5. Separation of contacting surfaces of dissimilar metals.
- B. Related Sections
 - 1. Section 07 52 13 "Atactic-Polypropylene-Modified Bituminous Membrane Roofing"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Shop Drawings: Submit, showing all materials, finishes, fastenings, joint details, fabrication, construction and relation to adjoining construction.
- C. Samples: Submit 12" x 12" samples of flashing materials and finishes.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

1.5 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during, and after installation, and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary at no additional cost to the City of New York.



PART 2 PRODUCTS

2.1 MATERIALS

A. Stainless Steel Flashing Materials

1. Stainless Steel Flashing: ASTM A 240, Type 304, stainless steel, with 2D finish, dead soft temper, fully annealed, as manufactured by International Nickel Co., Republic Steel Corp., United States Steel, or Washington Steel Corp. or approved equal. Provide stainless steel in thicknesses as listed below.
 - a. Concealed Flashings: 0.012" thick, thirty (30) gauge (U.S. Standard).
 - b. Exposed Flashings: 0.015" thick, twenty-eight (28) gauge (U.S. Standard).
 - c. Edge Strips: 0.025" thick, twenty-four (24) gauge (U.S. Standard).
2. Through-Wall Flashing: Stainless steel, with sawtooth ribs at three (3) inch intervals.
3. Accessories and Fastenings: AISI, Types 302 and 304 stainless steel.
4. Solder: Composed of sixty (60) percent block tin and forty (40) percent pig lead, except that solder at seams exposed to public view must be eighty (80) percent tin and twenty (20) percent lead.
5. Flux: An acid type flux manufactured specifically for soldering stainless steel, as approved.

- B. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type non-corrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 METAL FLASHING INSTALLATION

- A. Reference Standard: Conform to the requirements of 7th Edition of the Sheet Metal and Air Conditioning Contractors Association (SMACNA) Architectural Sheet Metal Manual.
- B. General: Fabricate and install metal flashing work in accordance with details and specifications of above Reference Standard, with manufacturer's instructions, and as herein specified, to provide a watertight installation. Apply metal flashing to smooth, even, sound, clean, dry surfaces free from defects. Make provisions to allow for expansion and contraction of metal flashing work. Wherever practicable, shop form all metal flashing work and deliver ready for installation. Form metal flashing work accurately to required profiles, with flat surfaces, straight edges and corners, free from defects. Fold exposed metal edges back not less than 1/2" and form drip.
- C. Nailing: Confine to sheets twelve (12) inches or less in width. Confine nailing to one edge only, locate nails where concealed. Use No. 12 x 1" long flat headed, annular threaded, Type 302 stainless steel nails for nailing to wood blocking; use one (1) inch long masonry nails for nailing to concrete. Space nails four (4) inches o.c. maximum.



- D. Cleating: Use cleats where sheets are more than twelve (12) inches in width. Space cleats approximately twelve (12) inches o.c. Cleats two (2) inches wide by three (3) inches long, of the same material and weight as the metal flashing being installed. Secure one end of the cleat with two (2) nails and fold edge back over the nail heads. Lock other end into seam or into folded edge of metal flashing sheets. Pre-tin cleats for soldered seams.
- E. Joining: Join metal flashings with one (1) inch locked and soldered seams except at slip joints. Mallet seams flat and solder full length of seam as specified below.
- F. Soldering: Clean and pre-tin edges of metal flashing to be soldered before soldering is begun with solder on both sides for a width of not less than 1-1/2". Solder slowly with well heated metal surfaces. Use ample solder. Show not less than one full inch of evenly flowed solder on seam. Seams must have a liberal amount of flux brushed in before soldering is commenced. Where soldering paste or killed acid is employed as a flux, soldering must follow immediately after application of the flux. Upon completion of soldering, clean surfaces of all flux.
- G. Slip Joints: Locate slip joints not more than twenty-four (24) feet apart and not more than eight (8) feet from corners. Form slip joints as three (3) inch wide joints with cover piece behind flashing, and fill locked ends neatly with sealant.
- H. Cap Flashing: Install over base flashings, in eight (8) to ten (10) foot lengths, lapped six (6) inches at ends. Increase cap flashing longitudinally to produce spring action to hold bottom edge of cap flashing firmly against base flashing. Cap flashing must lap base flashing at least four (4) inches, with exposed bottom edge at a forty-five (45) degree angle downward and folded back on underside at least 1/2" to form drip. Make cap flashing continuous at corners and angles.
- I. Miscellaneous Flashing: Provide all other miscellaneous metal flashing not specifically mentioned herein, but indicated on drawings and/or required to provide a watertight installation.
- J. Separation of Dissimilar Materials: Back paint surfaces of metal flashing in contact with dissimilar metals or with concrete or masonry with bituminous paint.
- K. Reglets
 - 1. Provide watertight reglets in masonry and concrete work to receive cap flashing. Form reglets of stainless steel using same thickness as stainless steel sheet metal specified.
 - 2. In masonry work use open or closed slot reglets with slot at least one (1) inch deep and 3/16" wide. Provide hook dams or turn-ups for anchoring securely into mortar joints. Insert cap flashing into slot full depth using button punch or lead wedges to lock in place.
 - 3. In concrete work, use open or closed slot reglets with slot sloped upward at forty-five (45) degrees, at least one (1) inch deep and 3/16" wide. For fastening reglets to concrete forms use double-head stainless steel nails spaced twelve (12) inches apart maximum.
 - 4. Insert cap flashing full depth into reglet slot, and wedge in place using lead strips spaced on twelve (12) inch centers maximum or lead caulking rope. When lead strips are used for continuous caulked reglets, use approved weather-resistant fibrous compounds.



- L. Through-Wall Flashings: Provide through-wall flashings as shown. Form bonding features so as not to puddle water on surface. Lap cross joints to interlock design pattern at least three (3) inches. Stop typical flashings in mortar joint 1/2" from exterior face of wall.

END OF SECTION 07 62 00



SECTION 07 71 00 - ROOF 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. Aluminum roof fascia assembly.
 - 2. Roof ventilation penthouses.
 - 3. Prefabricated roof curbs.
- B. Related Sections
 - 1. Section 07 52 13 "Atactic-Polypropylene-Modified Bituminous Membrane Roofing"
 - 2. Section 07 62 00 "Sheet Metal Flashing and Trim"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Before any roof specialties and accessories are delivered to the job site, submit shop drawings showing profiles and anchoring devices.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

1.5 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.



PART 2 PRODUCTS

2.1 ALUMINUM ROOF FASCIA ASSEMBLY

- A. Aluminum Sheet: Flat sheet complying with ASTM B209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with strength and durability properties of not less than Alloy 5005-H32.
 - 1. Thickness: 0.063" minimum or as shown on drawings.
- B. Provide concealed splice plate expansion joints 12'-0" o.c. fabricated of .050" thick aluminum to match exposed aluminum; finished to match exposed aluminum.
- C. Provide prefabricated mitered and welded corner units.
- D. Provide concealed anchors and hold down clips 24" o.c.
- E. High-Performance Organic Finish, Two-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat.
 - 1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 2. Custom color and gloss as selected by the Commissioner.

2.2 ROOF VENTILATION PENTHOUSES

- A. Louvered Penthouse-Style Gravity Ventilator: Manufacturer's standard, fabricated as indicated, with manufacturer's standard welded or sealed mechanical joints.
 - 1. Construction: Integral frame with base flange, weathertight cap, and weatherproof sidewall louvers.
 - 2. Provide stormproof louver with mitered corners, and removable hood lined with insulation to prevent condensation.
 - 3. Bird Screen: Manufacturer's standard mesh with rewirable frame.
 - 4. Frame, Base Flange, Cap, and Louver Material: Aluminum sheet, of manufacturer's standard thickness.
 - 5. Finish: As selected by Commissioner from manufacturer's full range.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide Greenheck; Model WIH/WRH or comparable product by one of the following:
 - 1. Loren Cook Company
 - 2. Romlair Ventilator Co.
 - 3. Or approved equal.



2.3 PREFABRICATED ROOF CURBS

- A. Provide manufacturer's standard shop fabricated units made of 14 ga. zinc coated steel factory primed with rust inhibitive primer, and insulated with 1-1/2" thick fiberglass board. Provide units manufactured by Pate, Louvers & Dampers, Inc., Industrial Louvers, Inc., or approved equal.
- B. Reinforce units over 8'-0" long and units requiring reinforcement due to heavy loads by forming units of double-walled box-type construction with stiffeners of heavy gauge with flanges as required to provide sufficient rigidity and strength to withstand max. lateral forces in addition to super imposed vertical loads.
- C. Sloping roof decks: For deck slopes of 1" per ft. and more, fabricate curb units to form a level top edge. Where slope is less than 1" per ft., and curb is used to support equipment with moving parts, or supports vertical elements such as gravity ventilators which are intended to be plumb, provide tapered wood nailers (treated wood) at top of curb units to form a level top edge.
- D. Provide treated wood nailer, not less than 1-5/8" thick and of the width shown, but not less than the width of the curb wall assembly. Anchor nailer securely to the top of the metal frame unit. Refer to Section 06 10 00 "Rough Carpentry" for pressure-treatment required for wood nailers.
- E. Provide 22 ga. galvanized steel curb liners; where required extend curb liners through deck construction to coordinate with work below.
- F. Provide 18 ga. galvanized steel cap flashing to cover a min. of 3" over roof flashing.
- G. Where curb units are shown to support shop fabricated items of equipment, do not proceed with fabrication of curb units until size or dimensions have been checked for coordination with equipment.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. General: Comply with manufacturer's instructions and recommendations. Coordinate with installation of roof deck and other substrates to receive accessory units, and with roof insulation, roofing and flashing; as required to ensure that each element of the work performs properly, and that combined elements are waterproof and weathertight. Anchor units securely to supporting structural substrates, adequate to withstand lateral and thermal stresses as well as inward and outward loading pressures.
- B. Isolation: Where metal surfaces of units are to be installed in contact with non-compatible metal or corrosive substrates, including wood, apply bituminous coating on concealed metal surfaces, or provide other permanent separation.
- C. Cap Flashing: Where cap flashing is required as component of accessory, install to provide adequate waterproof overlap with roofing or roof flashing (as counter flashing). Seal with thick bead of mastic sealant, except where overlap is indicated to be left open for ventilation.



- D. Operational Units: Test operational units with operable components. Clean and lubricate joints and hardware. Adjust for proper operation.

3.3 CLEANING AND PROTECTION

- A. Clean exposed metal and plastic surfaces in accordance with manufacturer's instructions. Touch up damaged metal coatings.

END OF SECTION 07 71 00



SECTION 07 84 00 - 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 through fire-resistance-rated floor and roof construction including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.
2. Penetrations through fire-resistance-rated walls and partitions including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.
3. Penetrations through smoke barriers and construction enclosing compartmentalized areas involving both empty openings and openings containing penetrating items.
4. Sealant joints in fire-resistance-rated construction.
5. Penetrations at each floor level in shafts and/or stairwells.
6. Construction joints, including those between top of fire rated walls and underside of floors above; and those between exterior curtain walls and the outer perimeter edge of floor assemblies.

B. Related Sections

1. Section 03 30 00 "Cast-in-Place Concrete"
2. Section 04 20 00 "Unit Masonry"
3. Section 07 92 00 "Joint Sealants"
4. Section 08 44 13 "Glazed Aluminum Curtain Walls"
5. Section 09 21 16 "Gypsum Board Assemblies"

1.3 REFERENCES

- A. ASTM E 814 "Standard Method of Fire Tests of Through-Penetration Firestops."
- B. UL 1479, UBC 7-5 (Both are same as A. above).
- C. ASTM E 136 "Standard Test Method for Assessing Combustibility of Materials"
- D. UL 263, UBC 7-1 "Fire Tests of Building Construction and Materials"



- E. UL 2079 "Tests For Fire Resistance of Building Joint Systems."
- F. ASTM E 1399 "Test For Dynamic Movement Conditions."
- G. ASTM E 1966 (Same as E. above).
- H. ASTM G 21 "Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi."
- I. Test Requirements: ASTM E 2307, "Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus."
- J. Inspection Requirements: ASTM E 2174, "Standard Practice for On-site Inspection of Installed Firestops."
- K. Published Through-Penetration Systems by recognized independent testing agencies.
 - 1. UL Fire Resistance Directory, Volume II of current year.
 - 2. Warnock Hersey Certification Listings, current year.
 - 3. Omega Point Laboratories, current year.
- L. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments.

1.4 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Submit manufacturer's product literature for each type of firestop material to be installed. Literature shall indicate product characteristics, typical uses, performance, limitation criteria, test data and indication that products comply with specified requirements.
- C. Submit shop drawings detailing materials, installation methods, and relationships to adjoining construction for each firestop system, and each kind of construction condition penetrated and kind of penetrating item. Include firestop design designation of qualified testing and inspection agency evidencing compliance with requirements for each condition indicated.
 - 1. Submit documentation, including illustrations, for proposed UL listed (or equal) firestop and smoke seal assembly required for the Project.
- D. Material Safety Data Sheets: Submit MSDS for each firestop product.
- E. Qualification Data: For Installer.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. General: Provide firestopping systems that are produced and installed to resist the spread of fire and the passage of smoke and other gases.
- C. Installation Responsibility: Assign installation of through-penetration firestop systems and fire-resistive joint systems in Project to a single sole source firestop installer.



- D. Firestopping materials shall conform to Flame (F) and Temperature (T) ratings as required by New York City Building Code and as tested by nationally accepted test agencies per ASTM E 814 or UL 1479. The F-rating must be a minimum of one (1) hour, but not less than the fire resistance rating of the assembly being penetrated. T-rating, when required by New York City Building Code, shall be based on measurement of the temperature rise on the penetrating item(s). The fire test shall be conducted with a minimum positive pressure differential of 0.01 inches of water column.
1. Penetrations in Horizontal Assemblies: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.
 - a. F-Rating: Minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.
 - b. T-Rating: When penetrant is located outside of a wall cavity, minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.
 - c. W-Rating: Class 1 rating in accordance with water leakage test per UL 1479.
 2. Penetrations in Smoke Barriers: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.
 - a. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at both ambient and elevated temperatures.
- E. Firestopping products shall be asbestos free and free of any PCBs.
- F. Do not use any product containing solvents.
- G. Do not use firestop products which after curing, dissolve in water.
- H. Do not use firestop products that contain ceramic fibers.
- I. Installer Qualifications: A firm that has been approved by FM Approval according to FM Approval 4991, "Approval Standard for Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."
- J. Mock-Up: Prepare job site mock-ups of each typical Firestop System proposed for use in the project. Approved mock-ups will be left in place as part of the finished project and will constitute the quality standard for the remaining work.
- K. For firestopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.
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 or more in width and exposed to possible loading and traffic, provide firestop systems capable of supporting the floor loads involved either by installing floor plates or alternative means.
 3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.



- L. Mold Resistance: Provide penetration firestopping with mold and mildew resistance rating of less than or equal to 1 as determined by ASTM G 21.
- M. Firestopping Materials are either "cast-in-place" (integral with concrete placement) or "post-installed." Provide cast-in-place firestop devices prior to concrete placement.
- N. Firestop systems do not reestablish the structural integrity of load bearing partitions or assemblies, or support live loads and traffic. Installer shall consult the Commissioner prior to penetrating any load bearing assembly.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacturer's original unopened containers with manufacturer's name, product identification, lot numbers, UL or Warnock Hersey labels, and mixing and installation instructions, as applicable.
- B. Store materials in the original, unopened containers or packages, and under conditions recommended by manufacturer.
- C. All firestop materials shall be installed prior to expiration of shelf life.

1.7 PROJECT CONDITIONS

- A. Do not use materials that contain solvents, show sign of damage or are beyond their shelf life.
- B. During installation, provide masking and drop cloths as needed to prevent firestopping products from contaminating any adjacent surfaces.
- C. Conform to ventilation requirements if required by manufacturer's installation instructions or Material Safety Data Sheet.
- D. Weather Conditions: Do not proceed with installation of firestop products when temperatures are in excess or below the manufacturer's recommendations.

1.8 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.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Tremco
 - 2. Bio-Fireshield
 - 3. 3M



4. Specified Technologies Inc.
5. U.S. Gypsum Co.
6. Nelson
7. Hilti, Inc.
8. GCP Applied Technologies.
9. Or approved equal.

2.2 FIRESTOPPING, GENERAL

- A. Compatibility: Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by firestopping manufacturer based on testing and field experience.
- B. Accessories: Provide components for each firestopping system that are needed to install fill materials. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire-resistance-rated systems. Accessories include the following items:
 1. Permanent forming/damming/backing materials including the following:
 - a. Semi-refractory fiber (mineral wool) insulation.
 - b. Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
 - c. Fire-rated form board.
 - d. Joint fillers for joint sealants.
 2. Temporary forming materials.
 3. Substrate primers.
 4. Collars.
 5. Steel sleeves.
- C. Applications: Provide firestopping systems composed of materials specified in this Section that comply with system performance and other requirements.
- D. Smoke seals at top of partitions shall be flexible to allow for partition deflection.
- E. Polypropylene Sleeves (PP): For cast-in device options.

2.3 FILL MATERIALS FOR THROUGH-PENETRATION FIRESTOP SYSTEMS

- A. Endothermic, Latex Compound Sealant: Single-component, endothermic, latex formulation.
- B. Intumescent, Latex Sealant: Single-component, intumescent, latex formulation.
- C. Intumescent Putty: Non-hardening, dielectric, water-resistant putty containing no solvents, inorganic fibers, or silicone compounds.



- D. Intumescent Wrap Strips: Single-component, elastomeric sheet with aluminum or polyethylene foil on one side.
- E. Job-Mixed Vinyl Compound: Prepackaged vinyl-based powder product for mixing with water at Project site to produce a paintable compound, passing ASTM E 136, with flame-spread and smoke-developed ratings of zero per ASTM E 84.
- F. Mortar: Prepackaged dry mix composed of a blend of inorganic binders, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a non-shrinking, homogeneous mortar.
- G. Pillows/Bags: Re-usable, heat-expanding pillows/bags composed of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents and fire-retardant additives.
- H. Silicone Foam: Two-component, silicone-based liquid elastomer that, when mixed, expands and cures in place to produce a flexible, non-shrinking foam.
- I. Silicone Sealant: Moisture-curing, single-component, silicone-based, neutral-curing elastomeric sealant of grade indicated below:
 - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces and non-sag formulation for openings in vertical and other surfaces requiring a non-slumping/gunnable sealant, unless firestop system limits use to non-sag grade for both opening conditions.
- J. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic or polypropylene sleeve lined with an intumescent strip, an extended rectangular flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
- K. Fire Rated Cable Management Devices: Factory-assembled round metallic sleeve device for use with cable penetrations, containing an integrated smoke seal fabric membrane that can be opened and closed for re-penetration.
- L. Drop-In Firestop Devices: Factory-assembled devices for use with combustible or noncombustible penetrants in cored holes within concrete floors. Device shall consist of galvanized steel sleeve lined with an intumescent strip, an extended rectangular flange attached to one end of the sleeve for fastening to concrete floor, and neoprene gasket.
- M. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- N. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized-steel sheet.
- O. Blocks/Plugs: Intumescent flexible block/plug suitable for reuse in re-penetration of openings. Blocks shall allow up to 12" of unreinforced annular space.
- P. Tub Box Kit: Cast-in place pre-formed plastic tub box kit with three support legs for use with drain piping assembly associated with bathtub installations.



2.4 FIRE-RESISTIVE ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated that complies with ASTM C 920 requirements, including those referenced for Type, Grade, Class, and Uses, and requirements specified in this Section applicable to fire-resistive joint sealants.
 - 1. Sealant Colors: Color of exposed joint sealants as selected by the Commissioner.
- B. Single-Component, Neutral-Curing Silicone Sealant: Type S; Grade NS; Class 25; exposure-related Use NT, and joint-substrate-related Uses M, G, A, and (as applicable to joint substrates indicated) O.
 - 1. Additional Movement Capability: Provide sealant with the capability to withstand 33 percent movement in both extension and compression for a total of 66 percent movement.
- C. Multi-Component, Non-Sag, Urethane Sealant: Type M; Grade NS; Class 25; exposure-related Use NT, and joint-substrate-related Uses M, A, and (as applicable to joint substrates indicated) O.
 - 1. Additional Movement Capability: Provide sealant with the capability to withstand 40 percent movement in extension and 25 percent in compression for a total of 65 percent movement in joint width existing at time of installation, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, and remain in compliance with other requirements of ASTM C 920 for uses indicated.
- D. Single-Component, Non-Sag, Urethane Sealant: Type S; Grade NS; Class 25; and Uses NT, M, A, and (as applicable to joint substrates indicated) O.

2.5 MINERAL FIBER/CERAMIC WOOL NON-COMBUSTIBLE INSULATION (FIRE SAFING)

- A. Provide min. 4 pcf safing insulation to suit conditions and to comply with fire resistance and firestop manufacturer's requirements.
- B. Material shall be classified non-combustible when tested per ASTM E 136.
- C. Product: Subject to compliance with requirements, provide one of the following:
 - 1. Thermafiber, Inc. (an Owens Corning company); Thermafiber Safing Mineral Wool Insulation
 - 2. Rockwool; Roxul Safe Fire Safing Insulation
 - 3. Johns Manville; Mineral Wool Safing
 - 4. Or approved equal.

2.6 MIXING

- A. For those products requiring mixing prior to application, comply with firestopping manufacturer's directions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce firestopping 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 PREPARATION

- A. Surface Cleaning: Clean out openings and joints immediately prior to installing firestopping to comply with recommendations of firestopping manufacturer and the following requirements:
 - 1. Remove all foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping.
 - 2. Clean opening and joint substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form release agents from concrete.
- B. Priming: Prime substrates where recommended by firestopping 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 firestopping from contacting adjoining surfaces that will remain exposed upon completion of work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestopping materials. Remove tape as soon as it is possible to do so without disturbing seal of firestopping with substrates.

3.3 CONDITIONS REQUIRING FIRESTOPPING

- A. Building Exterior Perimeters
 - 1. Where exterior facing construction is continuous past a structural floor, and a space (i.e. construction joint) would otherwise remain open between the inner face of the wall construction and the outer perimeter edge of the structural floor, provide firestopping to equal the fire resistance of the floor assembly.
 - a. If mineral wool is part of firestop system, the mineral wool must be completely covered by appropriate thickness of UL or Warnock Hersey listed firestop sealant or spray.
 - b. Refer to Article 3.6 herein for description of fire safing insulation.
 - 2. Firestopping shall be provided whether or not there are any clips, angles, plates, or other members bridging or interconnecting the facing and floor systems, and whether or not such items are continuous.
 - 3. Where an exterior wall passes a perimeter structural member, such as a girder, beam, or spandrel, and the finish on the interior wall face does not continue up to close with the underside of the structural floor above, thus interrupting the fire-resistive integrity of the wall system, and a space would otherwise remain open between the interior face of the wall and the structural member, provide firestopping to continuously fill such open space.
- B. Interior Walls and Partitions



1. Construction joints between top of fire rated walls and underside of floors above, shall be firestopped.
2. Firestop system installed shall have been tested by either UL or Omega Point, including exposure to hose stream test and including for use with steel fluted deck floor assemblies.
3. Firestop system used shall allow for deflection of floor above.

C. Penetrations

1. Penetrations include conduit, cable, wire, pipe, duct, or other elements which pass through one or both outer surfaces of a fire rated floor, wall, or partition.
 2. Except for floors on grade, where a penetration occurs through a structural floor or roof and a space would otherwise remain open between the surfaces of the penetration and the edge of the adjoining structural floor or roof, provide firestopping to fill such spaces in accordance with ASTM E 814.
 3. These requirements for penetrations shall apply whether or not sleeves have been provided, and whether or not penetrations are to be equipped with escutcheons or other trim. If penetrations are sleeved, firestop annular space, if any, between sleeve and wall of opening.
- D. Provide firestopping to fill miscellaneous voids and openings in fire rated construction in a manner essentially the same as specified herein before.

3.4 INSTALLING THROUGH PENETRATION FIRESTOPS

- A. General: Comply with the through penetrations firestop manufacturer's installation instructions and drawings pertaining to products and applications indicated.
- B. Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position needed to produce the cross sectional shapes and depths required to achieve fire ratings of designated through-penetration firestop systems. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.
- C. Install fill materials for through penetration firestop systems by proven techniques to produce the following results:
 1. Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.
 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 INSTALLING FIRE RESISTIVE JOINT SEALANTS

- A. General: Comply with ASTM C 1193, and with the sealant manufacturer's installation instructions and drawings pertaining to products and applications indicated.
- B. Install joint fillers to provide support of sealants during application and at position required to produce the cross sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability and develop fire resistance rating required.



- C. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross sectional shapes and depths relative to joint width that optimum sealant movement capability. Install sealants at the same time joint fillers are installed.
- D. Tool no sag sealants immediately after sealant application and prior to the time skinning or curing begins. Form smooth, uniform beads of configuration indicated or required to produce fire resistance rating, as well as to eliminate air pockets, and to ensure contact and adhesion of sealants with sides of joint. Remove excess sealant from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

3.6 INSTALLING FIRE SAFING INSULATION

- A. Install fire safing insulation utilizing welded or screw applied galvanized steel impaling pins and retaining clips; space clips or pins 24" o.c. maximum.
- B. Completely fill voids in areas where safing insulation is required. At spandrel conditions/floor edges, depth of insulation top to bottom shall be at least four (4) inches.
- C. Cover top of all safing insulation with firestop sealant or spray.

3.7 FIELD QUALITY CONTROL

- A. Special inspecting agency retained by the City of New York will examine completed firestopping to determine, in general, if it is being installed in compliance with requirements.
- B. Inspecting agency will report observations promptly and in writing to Contractor, City of New York and Commissioner.
- C. Where deficiencies are found, Contractor must repair or replace firestopping so that it complies with requirements.
- D. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

END OF SECTION 07 84 00



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. Flashing reglets and retainers.
2. Coping joints.
3. Exterior wall joints not specified to be sealed in other Sections of work.
4. Interior wall joints not specified to be sealed in other Sections of work, including caulking to fill between architectural woodwork and any wall, floor and/or ceiling imperfections.
5. Control and expansion joints in walls.
6. Joints at wall penetrations.
7. Joints between items of equipment and other construction.
8. All other joints required to be sealed to provide a positive barrier against penetration of air and moisture.

B. Related Sections

1. Section 07 52 13 "Atactic-Polypropylene-Modified Bituminous Membrane Roofing"
2. Section 07 84 00 "Firestopping"
3. Section 08 80 00 "Glazing" for glazing sealants.
4. Section 09 21 16 "Gypsum Board Assemblies" for sealant within drywall construction.
5. Section 09 30 13 "Ceramic Tiling" for sealant at tile work.

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Shop Drawings: Submit shop drawings showing all joint conditions, indicating relation of adjacent materials, all sealant materials (sealant, bond breakers, backing, primers, etc.), and method of installation.



1. Submit joint sizing calculations certifying that movement capability of sealant is not being exceeded.
- C. Samples: Submit the following:
 1. Color samples of sealants, submit physical samples (not color chart).
 2. Sealant bond breaker and joint backing.
- D. Product Data: Submit manufacturer's technical information and installation instructions for:
 1. Sealant materials, indicating that material meets standards specified herein.
 2. Backing rods.
- E. Submit manufacturer's certification as required by Article 1.5 herein.
- F. Submit results of testing required in Article 1.4 herein.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Qualification of Installers: Use only personnel who are thoroughly familiar, skilled and experienced in the techniques of sealant work, and who are completely familiar with the published recommendations of the sealant manufacturer.
- C. Pre-Construction Field Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to project joint substrates according to the method in ASTM C 794 and C 1521 that is appropriate for the types of Project joints.
- D. Perform testing per ASTM C 1248 on interior and exterior sealants to determine if sealants or primers will stain adjacent surfaces. No sealant work shall start until results of these tests have been submitted to the Commissioner and the Commissioner has given written approval to proceed with the work.

1.5 MANUFACTURER'S RESPONSIBILITY AND CERTIFICATION

- A. Contractor shall require sealant manufacturer to review the Project joint conditions and details for this Section of the work. Contractor shall submit to the Commissioner written certification from the sealant manufacturer that joints are of the proper size and design, that the materials supplied are compatible with adjacent materials and backing, that the materials will properly perform to provide permanent watertight, airtight or vaportight seals (as applicable), and that materials supplied meet specified performance requirements.

1.6 ENVIRONMENTAL CONDITIONS

- A. Temperature: Install all work of this Section when air temperature is above forty (40) degrees F. and below eighty (80) degrees F., unless manufacturer submits written instructions permitting sealant use outside of this temperature range.
- B. Moisture: Do not apply work of this Section on surfaces which are wet, damp, or have frost.



1.7 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section, before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.
- C. Storage: Store sealant materials and equipment under conditions recommended by their manufacturer.
 - 1. Do not use materials stored for a period of time exceeding the maximum recommended shelf life of the material.
 - 2. Material shall be stored in unopened containers with manufacturers' name, batch number and date when shelf life expires.

1.8 WARRANTY

- A. Provide a written, notarized warranty from the manufacturer stating that the applied sealants shall show no material failure for a period of ten (10) years.
- B. Contractor to provide a written, notarized, guarantee stating that the applied sealants shall show no failure due to improper installation for a period of two (2) years.
- C. Guarantee shall be in a form acceptable to the City of New York and executed by an authorized individual.
- D. Include in guarantee provision, agreement to repair and/or replace, at Contractor's expense, sealant defects which develop during guarantee period, because of faulty labor and/or materials.

PART 2 PRODUCTS

2.1 SEALANT MATERIALS

- A. Exterior Wall Sealant: Provide one (1) part non-sag sealant equal to No. 790 or 795 made by Dow Corning, "Silpruf SCS 2000" or "LM SCS 2700" made by G.E., "Spectrem 1" or "Spectrem 3" made by Tremco, "Sonolastic 150" made by Sonneborn, or "Sikasil WS-295" or "Sikasil WS-290" made by Sika conforming to the minimum standards of ASTM C 920, Type S, Grade NS, Class 50 or approved equal.
- B. Interior Sealant: Provide a one (1) part acrylic based sealant conforming to ASTM C 834, equal to "AC-20+ Silicone" made by Pecora or equal made by Tremco, Sherwin Williams or approved equal.
- C. Colors: Colors selected from manufacturer's standard selection.

2.2 MISCELLANEOUS MATERIALS

- A. Back-Up Materials: Provide back-up materials and preformed joint fillers, non-staining, non-absorbent, compatible with sealant and primer, and of a resilient nature, twenty-five (25) percent wider than joint width. Materials impregnated with oil, bitumen or similar materials shall not be used. Provide back-up materials only as recommended by sealant manufacturer in writing.
- B. Provide bond breakers, where required, of polyethylene tape as recommended by manufacturer of sealant.



- C. Provide primers recommended by the sealant manufacturer for each material to receive sealant. Note that each exterior joint must be primed prior to sealing.
- D. Provide solvent, cleaning agents and other accessory materials as recommended by the sealant manufacturer.
- E. Materials shall be delivered to the job in sealed containers with manufacturer's original labels attached. Materials shall be used per manufacturer's printed instructions.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. Sealant Installation Standard: Comply with instructions and recommendations of the manufacturer and in accordance with ASTM C 1193 for use of joint sealants as applicable to materials, applications and conditions required by this Project where more stringent installation requirements are specified herein, such requirements shall apply.
- B. Sample Section of Sealant: During sealant installation work in exterior wall, the manufacturer of sealant shall send his representative to the site, under whose supervision a section of the wall (used as "control section") shall be completed for purposes of determining performance characteristics of sealant in joints. Commissioner shall be informed of time and place of such installation of control section.
 - 1. Control section shall be installed according to specification given herein and shall not be considered as acceptable until written acceptance is provided by the Commissioner.
 - 2. Accepted control section shall be standard to which all other sealant work must conform.
- C. Supervision: The Contractor shall submit to the Commissioner written certification from the sealant manufacturer that the applicators have been instructed in the proper application of their materials. The Contractor shall use only skilled and experienced workmen for installation of sealant.
- D. Apply sealant under pressure with a hand or power actuated gun or other appropriate means. Gun shall have nozzle of proper size and provide sufficient pressure to completely fill joints as detailed. Neatly point or tool joint to provide the contour as indicated on the drawings.
- E. Preparation and Application
 - 1. Thoroughly clean all joints, removing all foreign matter such as dust, oil, grease, water, surface dirt and frost. Sealant must be applied to the base surface. Previously applied film must be entirely removed.
 - 2. Stone, masonry and concrete surfaces to receive sealant shall be cleaned where necessary by grinding, water blast cleaning, mechanical abrading, or combination of these methods as required to provide a clean, sound base surface for sealant adhesion.
 - a. Do not use any acid or other material which might stain surfaces.



- b. Remove laitance by grinding or mechanical abrading.
 - c. Remove loose particles present or resulting from grinding, abrading, or blast cleaning by blowing out joints with compressed air, oil and water free, or vacuuming joints prior to application of primer or sealant.
3. Clean non-porous surfaces such as metal and glass chemically. Remove protective coatings on metallic surfaces by solvent that leaves no residue and is compatible with sealant. Use solvent and wipe dry with clean, dry lint free paper towels. Do not allow solvent to air dry without wiping. Clean joint areas protected with masking tape or strippable films as above after removal of tape film.
 4. Do not seal joints until they are in compliance with drawings, or meet with the control section standard.
 5. Joint Size and Sealant Size: Joints to receive sealant shall be at least 1/4" wide. In joint 1/4" to 3/8" wide, sealant shall be 1/4" deep. In joints wider than 3/8" and up to 1" wide, sealant depth shall be one half the joint width. For joints wider than 1", sealant depth shall be as recommended by the sealant manufacturer. Depth of joint is defined as distance from outside face of joint to closest point of the filler.
 6. Primer: Thoroughly clean joints and apply primer to all surfaces that will receive sealant. Apply primer on clean, dry surfaces, and prior to installation of joint backing. Completely wet both inner faces of the joint with primer. Mask adjacent surfaces of joint with non-staining masking tape prior to priming. Apply primer with clean brush and only when temperature is above 45 deg. F.
 7. Joint Backing: In joints where depth of joint exceeds required depth of sealant, install joint backing (after primer is dry) in joints to provide backing and proper joint shape for sealant. Proper shape for sealant is a very slight "hourglass" shape, with back and front face having slight concave curvature. Use special blunt T-shaped tool or roller to install joint backing to the proper and uniform depth required for the sealant. Joint backing shall be installed with approximately twenty-five (25) percent compressions. Do not stretch, twist, braid, puncture, or tear joint backing. Butt joint backing at intersections.
 8. Bond Breaker: Install bond breaker smoothly over joint backing so that sealant adheres only to the sides of the joint and not backing.
 9. Sealant Application: Apply sealant in accordance with the manufacturer's application manual and manufacturer's instructions, using hand guns or pressure equipment, on clean, dry, properly prepared substrates, completely filling joints to eliminate air pockets and voids. Mask adjacent surfaces of joint with non-staining masking tape. Force sealant into joint in front of the tip of the "caulking gun" (not pulled after it) and force sealant against sides to make uniform contact with sides of joint and to prevent entrapped air or pulling of sealant off of sides. Fill sealant space solid with sealant.
 10. Tooling: Tool exposed joints to form smooth and uniform beds, with slightly concave surface conforming to joint configuration per Figure 4A in ASTM C 1193. Finished joints shall be straight, uniform, smooth and neatly finished. Remove masking tape immediately after tooling of sealant and before sealant face starts to "skin" over. Neatly remove any excess sealant from adjacent surfaces of joint, leaving the work in a neat, clean condition.

END OF SECTION 07 92 00



**Department of
Design and
Construction**

FMS No. - LNCA13HAM
Issue Date - 04/15/2022

THIS PAGE INTENTIONALLY LEFT BLANK



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 and exterior hollow metal doors and frames for fire rated and unrated door openings.
2. Interior hollow metal vision panels.
3. Preparation of metal doors and frames to receive finish hardware, including reinforcements, drilling and tapping, as necessary.
4. Preparation of hollow metal doors to receive glazing where required.
5. Steel louvers for hollow metal doors.
6. Furnishing anchors for building into masonry and drywall.
7. Factory prime painting of work of this Section.

- B. Related Sections

1. Section 04 20 00 "Unit Masonry"
2. Section 06 10 00 "Rough Carpentry" for installation of doors and frames.
3. Section 08 14 16 "Flush Wood Doors"
4. Section 08 71 00 "Door Hardware"
5. Section 08 80 00 "Glazing"
6. Section 09 21 16 "Gypsum Board Assemblies"
7. Section 09 90 00 "Painting and Coating"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".



- B. Product Data: Include construction details, material descriptions, core descriptions, label compliance, compliance with standards referenced herein, sound and fire-resistance ratings, and finishes for each type of door and frame specified.
- C. Shop Drawings: Show fabrication and installation of doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, reinforcement for surface applied hardware, dimensions of profiles and hardware preparation, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessories.
- D. Door Schedule: Submit schedule of doors and frames using same reference numbers for details and openings as those on Drawings.
 - 1. Coordinate glazing frames and stops with glass and glazing requirements.
- E. Oversize Construction Certification: For door assemblies required to be fire rated and exceeding limitations of labeled assemblies, submit UL certification that each door and frame assembly has been constructed to comply with design, materials, and construction equivalent to requirements for labeled construction.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Manufacturer Qualifications: A firm experienced in manufacturing custom steel doors and frames similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Testing Agency Qualifications: An independent agency qualified according to ASTM E 329 for testing indicated.
- D. Source Limitations: Obtain custom steel doors and frames through one source from a single manufacturer.
- E. Fire-Rated Door and Frame Assemblies: Assemblies complying with NFPA 80, Standard for Fire Doors and Other Opening Protectives, that are listed and labeled by UL, for fire-protection ratings indicated.
 - 1. Test Pressure: Test according to NFPA 252, Standard Methods of Fire Tests of Door Assemblies, or UL 10C, Standard for Positive Pressure Fire Tests of Door Assemblies. After 5 minutes into the test, the neutral pressure level in furnace shall be established at 40" or less above the sill.
 - 2. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide UL certification that doors comply with standard construction requirements for tested and labeled fire-protection-rated door assemblies except for size.
 - 3. Temperature-Rise Rating: At exit enclosures, provide doors that have a temperature-rise rating as required by New York City Building Code in 30 minutes of fire exposure.
- F. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80, Standard for Fire Doors and Other Opening Protectives, that are listed and labeled, by a testing and inspecting agency acceptable to the Commissioner, for fire-protection ratings indicated, based on testing according to NFPA 257, Standard on Fire Test for Window and Glass Block Assemblies, or UL 9, Standard for Fire Tests of Window Assemblies. Label each individual glazed lite.



- G. Smoke-Control Door Assemblies: Comply with NFPA 105, Standard for Smoke Door Assemblies and Other Opening Protectives, or UL 1784, Standard for Air Leakage Tests of Door Assemblies and Other Opening Protectives.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors and frames palletted, wrapped, or crated to provide protection during transit and Project site storage. Do not use nonvented plastic.
- B. Store doors and frames under cover at building site. Conform to the requirements of ANSI A 250-11, Recommended Erection Instructions for Steel Frames, for site storage unless more stringent requirements are noted herein. Place units on minimum 4-inch high wood blocking. Avoid using nonvented plastic or canvas shelters that could create a humidity chamber. If wrappers on doors become wet, remove cartons immediately. Provide minimum 1/4-inch spaces between stacked doors to permit air circulation.

PART 2 PRODUCTS

2.1 FABRICATION - GENERAL

- A. Fabricate hollow metal units to be rigid, neat in appearance and free from defects, warp or buckle. Accurately form metal to required sizes and profiles. Weld exposed joints continuously, grind, dress, and make smooth, flush and invisible. Metallic filler to conceal manufacturing defects is not acceptable.
- B. Unless otherwise indicated, provide countersunk flat Phillips or Jackson heads for exposed screws and bolts.
- C. Prepare hollow metal units to receive finish hardware, including cutouts, reinforcing, drilling and tapping in accordance with Finish Hardware Schedule and templates provided by hardware suppliers. Comply with applicable requirements of ANSI A115 "Specifications for Door and Frame Preparation for Hardware."
- D. Locate finish hardware as shown on final shop drawings in accordance with locations noted herein.

2.2 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Steelcraft
 - 2. Curries
 - 3. Ceco Door Products
 - 4. Or approved equal.

2.3 FRAMES

- A. Materials
 - 1. Frames for exterior openings shall be made of commercial grade cold-rolled steel conforming to ASTM A 1008, Standard Specification For Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy With Improved Formability, Solution Hardened, And Bake Hardenable, Type B not less than 14 ga., and shall have a hot dipped galvanized coating conforming



to ASTM A 924, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process, and A 653, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process, with A-60 coating. The zinc-alloy coating shall be a dull matte surface treated for paint adhesion.

2. Frames for interior openings shall be either commercial grade cold-rolled steel conforming to ASTM A 1008, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy With Improved Formability, Solution Hardened, And Bake Hardenable, Type B or commercial grade hot-rolled steel conforming to ASTM A 1011, Commercial Steel, Type B. Metal thickness shall be not less than sixteen (16) ga. for frames in openings 4'-0" or less in width; not less than fourteen (14) ga. for frames in openings over 4'-0" in width.

B. Design and Construction

1. All frames shall be welded units with integral trim, of the sizes and shapes shown on approved shop drawings. Knock-down frames are not permitted.
2. All finished work shall be strong and rigid, neat in appearance, square, true and free of defects, warp or buckle. Molded members shall be clean cut, straight and of uniform profile throughout their lengths.
3. Jamb depths, trim, profile and backbends shall be as shown on drawings.
 - a. Frames at drywall partitions shall be formed with double return backbends to prevent cutting into drywall surface.
4. Welded frames shall have corners mitered and reinforced and faces of welded frames shall be continuously back welded full depth and width of frame conforming to NAAMM Standard HMMA-820; face joints shall be hairline.
5. Minimum depth of stops shall be 5/8".
6. Frames for multiple or special openings shall have mullion and/or rail members which are closed tubular shapes having no visible seams or joints. All joints between faces of abutting members shall be securely welded and finished smooth.
 - a. Mullions shall have 16 ga. internal steel stiffeners welded not less than 4" o.c.
7. Hardware Reinforcements
 - a. Frames shall be mortised, reinforced, drilled and tapped at the factory for fully-templated mortised hardware only, in accordance with approved hardware schedule and templates provided by the hardware supplier. Where surface-mounted hardware is to be applied, frames shall have reinforcing plates.
 - b. Minimum thickness of hardware reinforcing plates shall be as follows:
 - 1). Hinge and pivot reinforcements - seven (7) ga., 1-1/4" x 10" minimum size.
 - 2). Strike reinforcements - twelve (12) gauge
 - 3). Flush bolt reinforcements - twelve (12) gauge
 - 4). Closer reinforcements - twelve (12) gauge
 - 5). Reinforcements for surface mounted hardware - twelve (12) gauge.



8. Floor Anchors
 - a. Provide adjustable floor anchors, providing not less than two (2) inch height adjustment.
 - b. Minimum thickness of floor anchors shall be fourteen (14) gauge.
 9. Jamb Anchors
 - a. Frames for installation in masonry walls shall be provided with adjustable jamb anchors of the wire type. Anchors shall be not less than 0.156" diameter steel wire. The number of anchors provided on each jamb shall be as follows:
 - 1). Frames up to 7'-6" height - three (3) anchors.
 - 2). Frames 7'-6" to 8'-0" height - four (4) anchors.
 - 3). Frames over 8'-0" height - one (1) anchor for each 2'-0" or fraction thereof in height.
 - b. Frames for installation in stud partitions shall be provided with steel anchors of suitable design, not less than eighteen (18) gauge thickness, securely welded inside each jamb as follows:
 - 1). Frames up to 7'-6" height - four (4) anchors.
 - 2). Frames 7'-6" to 8'-0" height - five (5) anchors.
 - 3). Frames over 8'-0" height - five (5) anchors plus one additional for each 2'-0" or fraction thereof over 8'-0".
 10. Anchors in exterior frames and in masonry walls shall be hot dip galvanized per ASTM A 153.
 11. Frames for installation in masonry wall openings more than 4'-0" in width shall have an angle or channel stiffener factory welded into the head. Such stiffeners shall be not less than twelve (12) gauge steel and not longer than the opening width, and shall not be used as lintels or load bearing members.
 12. Dust cover boxes (or mortar guards) of not thinner than twenty-six (26) gauge steel shall be provided at all hardware mortises on frames to be set in masonry or plaster partitions.
 13. Ceiling Struts: Minimum 3/8" thick x 2" wide steel.
 14. All frames shall be provided with a steel spreader temporarily attached to the feet of both jambs to serve as a brace during shipping and handling.
 15. Loose glazing stops shall be of cold rolled steel, not less than twenty (20) gauge thickness, butted at corner joints and secured to the frame with countersunk cadmium-or zinc-plated screws. Interior frames may be provided with snap-on glazing stops.
 16. Except on weatherstripped frames, drill stops to receive three (3) silencers on strike jambs of single door frames and two (2) silencers on heads of double-door frames.
- C. Finish: After fabrication, all tool marks and surface imperfections shall be removed, and exposed faces of all welded joints shall be dressed smooth. Frames shall then be chemically treated to ensure maximum paint adhesion and shall be coated on all surfaces with one coat of rust-inhibitive baked-on alkyd primer standard with the manufacturer which is fully cured before shipment to a dry film thickness of 2.0 mils.
1. Frames set in masonry walls shall be grouted in as described in Section 04 20 00, "Unit Masonry."
 2. Epoxy coating for surfaces in contact with grout: Epoxy coating spray applied at 4 to 6 mils, passing NFPA 101, Class A for smoke and flame spread, tested per ASTM E 84.



- a. Basis-of-Design Product: Subject to compliance with requirements, provide Tnemec; Series 27 FC Typoxy or comparable product by one of the following:
 - 1). PPG
 - 2). Benjamin Moore
 - 3). Sherwin Williams
 - 4). Or approved equal.

2.4 HOLLOW METAL DOORS

- A. Materials: Doors shall be made of commercial quality, level, cold rolled steel conforming to ASTM A 1008, Commercial Steel, Type B and free of scale, pitting or other surface defects. Face sheets for interior doors shall be not less than eighteen (18) gauge. Face sheets for exterior doors shall be not less than sixteen (16) gauge and shall have a hot dipped galvanized coating conforming to ASTM A 924 and A 653, A60 coating. The zinc alloy coating shall be a dull matte surface treated for paint adhesion.

B. Design and Construction

1. All doors shall be of the types and sizes shown on the approved shop drawings, and shall be fully welded seamless construction with no visible seams or joints on their faces or vertical edges. Minimum door thickness shall be 1-3/4".
2. All doors shall be strong, rigid and neat in appearance, free from warpage or buckles. Corner bends shall be true and straight and of minimum radius for the gauge of metal used.
3. All exterior hollow metal doors must be insulated in compliance with New York City Energy Conservation Code.
4. Face sheets shall be stiffened by continuous vertical formed steel sections spanning the full thickness of the interior space between door faces. These stiffeners shall be not less than twenty two (22) gauge spaced not more than six (6) inches apart and securely attached to face sheets by spot welds not more than five (5) inches o.c. Spaces between stiffeners shall be sound deadened and thermal insulated the full height of the door with an inorganic non-combustible batt type material.
5. Door faces shall be joined at their vertical edges by a continuous weld extending the full height of the door. All such welds shall be ground, filled and dressed smooth to make them invisible and provide a smooth flush surface.
6. Top and bottom edges of all doors shall be closed with a continuous recessed steel channel not less than fourteen (14) gauge, extending the full width of the door and spot welded to both faces. Exterior doors shall have an additional flush closing channel at their top edges and, where required for attachment of weatherstripping, a flush closure also at their bottom edges. Openings shall be provided in the bottom closure of exterior doors to permit the escape of entrapped moisture.
7. Edge profiles shall be provided on both vertical edges of doors as follows:
 - a. Single-Acting Swing Doors: Beveled 1/8" in two (2) inches.
 - b. Double-Acting Swing Doors: Rounded on 2-1/8" radius.
 - c. No square edge doors permitted.

8. Hardware Reinforcements



- a. Doors shall be mortised, reinforced, drilled and tapped at the factory for fully templated hardware only in accord with the approved hardware schedule and templates provided by the hardware supplier. Where surface-mounted hardware (or hardware, the interrelation of which is to be adjusted upon installation - such as top and bottom pivots, floor closers, etc.) is to be applied, doors shall have reinforcing plates.
- b. Minimum gauges for hardware reinforcing plates shall be as follows:
 - 1). Hinge and pivot reinforcement - seven (7) gauge.
 - 2). Reinforcement for lock face, flush bolts, concealed holders, concealed or surface mounted closers - twelve (12) gauge.
 - 3). Reinforcements for all other surface mounted hardware - sixteen (16) gauge.

9. Glass Moldings and Stops

- a. Where specified or scheduled, doors shall be provided with hollow metal moldings to secure glazing by others in accordance with glass opening sizes shown on drawings.
- b. Fixed moldings shall be securely welded to the door on the security side.
- c. Loose stops shall be not less than twenty (20) gauge steel, with mitered corner joints, secured to the framed opening by cadmium or zinc-coated countersunk screws spaced eight (8) inches o.c. Snap-on attachments will not be permitted. Stops shall be flush with face of door.

10. Louvers shall be sixteen (16) gauge sheet steel, stationary type, closely spaced inverted "V" blade design, flush with face sheets of door, integral with and welded to door. Fifty (50) percent free area, unless indicated otherwise on drawings.

- C. Finish: After fabrication, all tool marks and surface imperfections shall be dressed, filled and sanded as required to make all faces and vertical edges smooth, level and free of all irregularities. Doors shall then be chemically treated to ensure maximum paint adhesion and shall be coated, on all exposed surfaces, with manufacturer's standard rust-inhibitive alkyd primer as specified for frames which shall be fully cured before shipment.
- D. Flatness: Doors shall maintain a flatness tolerance of 1/16" maximum, in any direction, including in a diagonal direction.

2.5 LABELED DOORS AND FRAMES

- A. Labeled doors and frames shall be provided for those openings requiring fire protection ratings as scheduled on drawings. Such doors and frames shall be labeled by Underwriters' Laboratories or other nationally recognized agency having a factory inspection service.
- B. If any door or frame specified by the Commissioner to be fire-rated cannot qualify for appropriate labeling because of its design, size, hardware or any other reason, the Commissioner shall be so advised before fabricating work on that item is started.

2.6 HARDWARE LOCATIONS

- A. The location of hardware on doors and frames shall be as noted in "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames" of the Door Hardware Institute unless otherwise required by New York City Building Code.



2.7 CLEARANCES

A. Fabricate doors and frames to meet edge clearances as follows:

1. Jambs and Head: 1/8" plus or minus 1/16".
2. Meeting Edges, Pairs of Doors: 1/8" plus or minus 1/16".
3. Bottom: 3/8" at threshold; 3/4" if no threshold.

B. Fire rated doors shall have clearances as required by NFPA 80.

2.8 MANUFACTURING TOLERANCES

A. Manufacturing tolerance shall be maintained within the limits given in HMMA 841 of ANSI/NAAMM, current edition.

2.9 PREPARATION FOR FINISH HARDWARE

A. Prepare door and frames to receive hardware:

1. Hardware supplier shall furnish hollow metal manufacturer approved hardware schedule, hardware templates, and samples of physical hardware where necessary to ensure correct fitting and installation.
2. Preparation includes sinkages and cut-outs for mortise and concealed hardware.

B. Provide reinforcements for both concealed and surface applied hardware:

1. Drill and tap mortise reinforcements at factory, using templates.
2. Install reinforcements with concealed connections designed to develop full strength of reinforcements.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

A. Refer to Section 06 10 00 "Rough Carpentry" for installation procedures for all work of this Section.

END OF SECTION 08 11 13



SECTION 08 14 16 - FLUSH WOOD DOORS

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 solid core flush wood doors.
- B. Related Sections
 - 1. Section 06 10 00 "Rough Carpentry" for installation of wood doors.
 - 2. Section 08 11 13 "Hollow Metal Doors and Frames" for hollow metal frames.
 - 3. Section 08 71 00 "Door Hardware"
 - 4. Section 08 80 00 "Glazing"
 - 5. Section 09 90 00 "Painting and Coating" for field painting.

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: Submit door manufacturer's product data, specifications and installation instructions for each type of wood door.
 - 1. Include details of core and edge construction and trim for openings.
 - 2. Include factory finish specifications.
 - 3. Include certifications to show compliance with specifications.
 - 4. Include certification to show compliance with AWI and WDMA requirements specified herein.
- C. Shop Drawings: Submit shop drawings indicating location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire ratings, and requirements for finishing.
 - 1. Include requirements for veneer matching.
- D. Samples: Submit factory finishes applied to actual door face materials, approximately 8 by 10 inches for each material and finish. For each wood species and transparent finish, provide samples showing typical range of color and grain to be expected in the finished work.



1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Source Limitations: Obtain flush wood doors through one source from a single manufacturer.
- C. Quality Standard: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated"; latest edition "Premium" grade and WDMA "Extra Heavy Duty" Performance Level.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in plastic bags or cardboard cartons.
- C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.7 WARRANTY

- A. Warranty: Manufacturer's standard form, signed by manufacturer, in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship, have warped (bow, cup, or twist) in excess of permitted standard noted in Article 2.5 herein, or show telegraphing of core construction in face veneers.
 - 1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
 - 2. Warranty shall be in effect during the following period of time from date of Substantial Completion:
 - a. Solid Core Flush Wood Doors: Five Years.

PART 2 PRODUCTS

2.1 SOLID CORE FLUSH WOOD DOORS

- A. Provide AWI PC-5 Premium Grade hot pressed 5-ply solid core particleboard doors, 1-3/4" thick, conforming to standards specified herein. Subject to meeting standards specified herein, the following manufacturers are acceptable: Masonite, VT Industries, Mohawk or approved equal.
 - 1. Core shall consist of a formed flat panel consisting of wood particles bonded together with synthetic resins or other added binder, with an average density of 30 to 32 lbs. per cubic foot. The material shall meet or exceed the requirements of ANSI A208.1, Grade 1-LD-2 covering mat formed particleboard with face screw holding of 124 lbs., modulus of rupture of minimum 700 psi and modulus of elasticity of not less than 148,000 psi.



2. Core shall be capable of satisfying this WDMA TM-7 cycle slam test for 1 million slams for surface mounted hardware. Where the manufacturer's core does not meet this criteria, stiles and rails must measure a minimum of 5-1/2" and must be fabricated of hardwood.

- a. Surface mounted hardware must be installed with minimum 1-1/4" screw penetrations using threaded to the head screws; coordinate with Section 08 71 00 "Door Hardware".
- B. Cross Bands: Shall be 1/16" thick hardwood extending full width of door and laid with grain at right angles to face veneers. Cross bands and faces shall be laminated to the core with Type I MF or PVA glue.
- C. Stiles, Rails: Stile and rail shall be a minimum of 1-3/8" solid hardwood or structural composite lumber (after trimming) laminated to the core. Stiles and rails must be securely glued to the core with no voids allowed. Stiles and rails must be capable of screw holding of 550 lbs. per WDMA TM-10.
- D. Vertical door edge must be capable of screw holding of 550 lbs. per WDMA TM-10; horizontal door edge must be capable of screw holding of 400 lbs. per WDMA TM-10.
- E. Doors with transparent finish to have center balanced, slip matched, quarter sliced veneer; species as selected by Commissioner. Veneer to conform to AWI, "AA" grade veneer with 3" wide leaf. Minimum veneer thickness shall be not less than 1/50" after sanding.
 1. Veneers shall be continuous or end matched at transoms.
- F. Doors shall have hinge loading capacity of 500 lbs. per WDMA TM-8.
- G. Where glass lites are noted, factory cut openings. Trim openings with solid hardwood moldings of same type of wood as face veneer. Lite openings in 20 minute rated doors shall have manufacturer's 20 minute approved hardwood system.
- H. Doors to be field painted shall have MDO or hardboard face.

2.2 SHOP FINISH

- A. Transparent Finish: Finish in the shop with clear satin catalyzed polyurethane finish conforming to AWI System "Catalyzed Polyurethane Transparent".
- B. Opaque Finish: For doors to be field painted, shop prime on all surfaces with one coat of alkyd wood primer applied to a dry film thickness of 1.5 mils.

2.3 FABRICATION

- A. Prefit and premachine wood doors at the factory.
- B. Comply with the tolerance requirements specified herein. Machine doors for hardware requiring cutting of doors. Comply with final hardware scheduled and door frame shop drawings, and with hardware templates and other essential information required to ensure proper fit of doors and hardware.
- C. Doors shall be factory sized to door opening so that trimming and fitting are not required in the field.
- D. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances unless otherwise indicated.



1. Three degree bevel or bevel to suit frame sizes indicated, with 3/16" prefit in width, +0/-1/32" tolerances. Prefit top of door 1/8" + 1/16"/-0" and undercut as required by floor condition. Undercut shall not exceed 1/8" from bottom of door to top of finished floor; where threshold occurs undercut shall not exceed 1/8" from bottom of door to top of threshold.
- E. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3 unless otherwise noted. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.
 1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.
- F. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kinds of doors required.

2.4 SOURCE QUALITY CONTROL

- A. Once installed, maximum allowable warp, bow, cut or twist in doors shall be 1/16" as measured by the 1/16 inch feeler gauge and a straight-edge extending from corner to corner of the door face at stiles, top and bottom rails and along both diagonals.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. Refer to Section 06 10 00 "Rough Carpentry" for installation of wood doors.

END OF SECTION 08 14 16



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. Frameless hinged gypsum access panels with rounded corners at drywall ceilings and walls.
- 2. Provide access doors and frames for access from occupied spaces to the following, where indicated or required.
 - a. All shutoff or balancing valves.
 - b. Fire dampers, as required.
 - c. Points of duct access.
 - d. Pull boxes.
 - e. Controls of mechanical and electrical items.
 - f. Pipe spaces, if required.
 - g. Inlets of fans.
 - h. Fusible link and splitter damper at filter bank.
 - i. Automatic damper and motor.
 - j. Equipment not otherwise accessible.

- B. Related Sections

- 1. Section 09 21 16 "Gypsum Board Assemblies"
- 2. Section 22 05 23 "General Duty Valves for Plumbing Piping"
- 3. Section 23 33 00 "Air Duct Accessories" for HVAC duct access doors.

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Submit complete manufacturer's literature.
- C. Submit plans and schedules showing size and location of each and every access door.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".



- B. For actual installation of the work of this Section, use only personnel who are thoroughly familiar with the manufacturer's recommended methods of installation and experienced in the skills required.
- C. Fire-Resistance Ratings: Wherever a fire-resistance classification is shown, or for construction where access doors are installed, provide required access door assembly with panel door, frame, hinge and latch from manufacturers listed in Underwriters' Laboratories, Inc. "Classified Building Materials Index" for the rating shown.
 - 1. Provide UL label on each access panel.
 - 2. Provide flush, key operated cylinder lock.
- D. Size Variations: Obtain Commissioner's acceptance of manufacturer's standard size units which may vary slightly from sizes shown or scheduled.

PART 2 PRODUCTS

2.1 ACCESS DOORS AND FRAMES

- A. Frameless Units for Drywall Surfaces (Recessed Panel Units): Provide access doors without exposed frames for drywall adhered to recessed panel. Doors shall be fabricated from aluminum, with factory installed gypsum board inlay, rounded corners, concealed hardware and touch latch, and air tight gaskets.
 - 1. Type 1
 - a. Size: 30" x 30"
 - b. Quantity: 15
 - 2. Type 2
 - a. Size: 12" x 12"
 - b. Quantity: 20
- B. Assembly shall be an integral unit complete with all parts and ready for installation.
- C. Locking Devices: Concealed touch latch unless otherwise noted.
 - 1. For fire rated doors, provide locks as described in paragraph 1.4, C. herein.
- D. Basis-of-Design Product: Subject to compliance with requirements, provide Access Panel Solutions; Bauco Plus or comparable product by one of the following:
 - 1. Acudor Products, Inc.
 - 2. Karp Associates, Inc.
 - 3. Nystrom Inc.
 - 4. Or approved equal.



PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. Set frames accurately in position and securely attach to supports with face panels plumb or level in relation to adjacent finish surfaces.
- B. Adjust hardware and panels after installation for proper operation.

END OF SECTION 08 31 13



THIS PAGE INTENTIONALLY LEFT BLANK



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. Exterior glazed channel frame storefront.
 - 2. Glazed aluminum entrance doors.
 - 3. Door operators.
 - 4. Door operator controls.
 - 5. Aluminum shapes and trim.
- B. Related Sections
 - 1. Section 07 92 00 "Joint Sealants"
 - 2. Section 08 44 13 "Glazed Aluminum Curtain Walls"
 - 3. Section 08 71 00 "Door Hardware"
 - 4. Section 08 80 00 "Glazing"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: Submit manufacturer's printed product data, specifications, standard details, installation instructions, use limitations and recommendations for each material used. Provide certifications that materials and systems comply with specified requirements.
- C. Shop Drawings: Provide large scale shop drawings for fabrication, installation and erection of all parts of work. Provide plans, elevations, and details of anchorages, connections and accessory items. Provide installation templates for work installed by others. Show interfaces and relationships to work of other trades.
- D. Field Measurements: Take necessary field measurements before preparation of shop drawings and fabrication. Do not delay progress of job. If field measurements are not possible prior to fabrication, allow for field cutting and fitting.



- E. Initial Selection Samples: Submit samples showing complete range of colors, textures, and finishes available for each material used.
- F. Verification Samples: Submit representative samples of each material that is to be exposed in completed work. Show full color ranges and finish variations expected. Provide samples having minimum size of 144 sq. in.
- G. Calculations: Provide professionally prepared calculations and certification of performance of this work. Indicate how design requirements for loading and other performance criteria have been satisfied; refer to Article 1.4, para. D for further description.
- H. Test Reports: Provide certified test reports for specified tests.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Source: For each material type required for work of this Section, provide primary materials which are products of one manufacturer. Provide secondary or accessory materials which are acceptable to manufacturers of primary materials.
- C. Installer: A firm with a minimum of three years' experience in type of work required by this Section.
- D. Design Criteria: Drawings indicate sizes, member spacings, profiles, and dimensional requirements of work of this Section. Minor deviations will be accepted in order to utilize manufacturer's standard products when, in the Commissioner's sole judgment, such deviations do not materially detract from the design concept or intended performances.
- E. Engineering: Provide services of a Professional Engineer, licensed in the State of New York, to design and certify that work of this Section meets or exceeds performance requirements specified.
- F. Energy Performance: Comply with the 2016 New York City Energy Conservation Code (NYCECC). Glazed aluminum curtain walls shall have certified and labeled energy performance ratings in accordance with National Fenestration Rating Council, Inc. (NFRC).

1. Thermal Transmittance (U-factor)

- a. Fixed fenestration shall have U-factor of not more than 0.33 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
 - b. Entrance doors shall have U-factor of not more than 0.49 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
2. Solar Heat Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of as follows as determined according to NFRC 200.
- a. PF less than 0.2: 0.40
 - b. 0.2 less than or equal to PF less than 0.5: 0.48
 - c. PF greater than or equal to 0.5: 0.64



1.5 TESTS AND PERFORMANCE REQUIREMENTS

- A. Manufacturer's Standard Tests: Provide manufacturer's standard test data showing compliance with specified requirements.
- B. Testing and performance data applies to exterior assemblies.
- C. Test Sequence: Test sequence is optional, except that air infiltration tests shall precede water resistance tests.
- D. Air Infiltration Test: Test unit in accordance with ASTM E 283, as follows:
 - 1. Static Air Pressure Difference: 6.24 psf for fixed storefront units, and 1.567 psf for doors.
 - 2. Performance: Maximum air leakage shall not exceed the following:
 - a. Fixed Storefront Units: 0.06 cfm per sq. ft. of window area.
 - b. Door Units: 0.50 cfm per sq. ft. of single doors, 1.00 cfm per sq. ft. for doors hinged in pairs.
- E. Water Leakage Test: Test fixed framing system in accordance with ASTM E 331.
 - 1. Test Pressure: 6.24 psf.
 - 2. Performance: No leakage as defined in test method at specified test pressure.
- F. Uniform Load Deflection Test: Test units in accordance with ASTM E 330, at following static air pressure difference (Design Wind Pressure), or loads prescribed by the New York City Building Code, whichever is greater. Apply pressure first to exterior side (positive) and then interior side (negative).
 - 1. Design Wind Pressure: 30 pounds per square foot minimum.
 - 2. Test Procedure: Procedure A as specified in ASTM E 330.
 - 3. Performance: Deflection in each member measured at locations of greatest deflection shall not exceed L/175 at specified Design Wind Pressure.
- G. Uniform Load Structural Test: Test units in accordance with ASTM E 330 at following static air pressure difference. Apply high pressure load first on one side and then on other side. At conclusion of test there shall be no glass breakage, permanent damage to fasteners, hardware parts, support arms or activating mechanisms.
 - 1. Static Air Pressure: Minimum 1.5 times the Design Wind Pressure.
 - 2. Permanent Deformation in Any Member: Not to exceed 0.2% of member span.
- H. Condensation Resistance Factor: Not less than 45 for fixed storefront units, and not less than 48 for doors; per AAMA 1502.7.
- I. Thermal Movement: Provide storefront systems that allow for expansion and contraction of members throughout an ambient temperature range of 120 degrees F.



- J. Seismic Loads: Provide entrance and storefront systems, including anchorage, capable of withstanding the effects of earthquake motions calculated according to requirements of the New York City Building Code or ASCE 7, "Minimum Design Loads for Buildings and Other Structures," Section 9, "Earthquake Loads," whichever are more stringent.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials and products in unopened, factory labeled packages. Store and handle in strict compliance with manufacturer's instructions and recommendations. Store under cover and protect from weather damage.
- B. Sequence deliveries to avoid delays, but minimize on-site storage.

1.7 WARRANTIES

- A. Provide written warranty, signed by manufacturer, agreeing to repair or replace work that exhibits defects in materials or workmanship. "Defects" is defined to include, but not be limited to, leakage of water, abnormal aging or deterioration, abnormal deterioration or fading of finishes, and failure to perform as required. Include requirement for removal and replacement of covering and connected adjacent work.
 - 1. Warranty Period: Three (3) years from date of Substantial Completion; except finish shall be warranted for a period of fifteen (15) years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS/PRODUCTS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide C.R. Laurence Co., Inc. (CRL); CRL "Entice" Entrance System with 10" bottom rail and sidelites, or comparable product by one of the following:
 - 1. US Aluminum
 - 2. Blumcraft
 - 3. Or approved equal.

2.2 MATERIALS AND ACCESSORIES

- A. Aluminum Members: Provide 6063-T5 alloy and temper as recommended by manufacturer for strength, corrosion resistance, and application of required finish. Comply with ASTM B 221 for extrusions, and ASTM B 209 for sheet/plate. Provide 0.125" thick extrusions for door stiles and storefront framing. Provide 0.050" thick aluminum for glazing moldings.
 - 1. Structural aluminum shapes shall conform to ASTM B 308.
 - 2. Aluminum Shapes and Trim: As detailed.
- B. Fasteners: Provide non-magnetic stainless steel fasteners, warranted by manufacturer to be non-corrosive and compatible with aluminum components.



- C. Concealed Flashing: Dead-soft stainless steel, 26 gauge minimum, or extruded aluminum 0.062" minimum, of an alloy and type selected by manufacturer for compatibility with other components.
- D. Brackets and Reinforcements: Non-magnetic stainless steel or hot-dip galvanized steel complying with ASTM A 386.
- E. Concrete/Masonry Inserts: Cast-iron, malleable iron, or hot-dip galvanized steel complying with ASTM A 386.
- F. Bituminous Coatings: Cold-applied asphalt mastic compounded for 30-mil thickness per coat.
- G. Compression Weatherstripping: Manufacturer's standard replaceable stripping of molded neoprene or PVC gaskets complying with ASTM D 2287.
- H. Sliding Weatherstripping: Manufacturer's standard replaceable stripping of wool, polypropylene, or nylon woven pile, with nylon fabric or aluminum strip backing.

2.3 HARDWARE

- A. Provide hardware units as indicated, scheduled, or required for operation of each door. Refer to Section 08 71 00, Door Hardware for hardware description.
- B. Door Operators and Door Operator Controls
 - 1. Floor-Recessed Door Operators: dormakaba; ED250-IG low profile automatic operator (Dorma #250), or comparable product by Assa Abloy, Stanley or approved equal.
 - 2. Bollard-Mounted Door Operator Controls: MS Sedco; 59J-H Jamb Style Push Plate Switches or comparable product by Disability Systems, Stanley Access Systems or approved equal.
 - a. Provide all low voltage wiring, connections, etc.
 - b. Installation: See details on Architectural drawings.

2.4 FABRICATION

- A. Sizes and Profiles: Required sizes for door and frame units, including profile requirements, are indicated on Drawings. Any variable dimensions are indicated, together with maximum and minimum dimensions required to achieve design requirements and coordination with other work.
- B. Prefabrication: To greatest extent possible, complete fabrication, assembly, finishing, hardware application, and other work before shipment to project site. Disassemble components only as necessary for shipment and installation.
 - 1. Preglaze door and frame units to greatest extent possible, in coordination with installation and hardware requirements.
 - 2. Do not drill and tap for surface-mounted hardware items until time of installation at project site.
 - 3. Perform fabrication operations, including cutting, fitting, forming, drilling and grinding of metal work in manner which prevents damage to exposed finish surfaces. For hardware, perform these operations prior to application of finishes.



- C. Welding: Comply with recommendations of American Welding Society to avoid discoloration; grind exposed welds smooth and restore mechanical finish.
- D. Reinforcing: Install reinforcing as necessary for performance requirements; separate dissimilar metals with bituminous paint or other separator to prevent corrosion.
- E. Continuity: Maintain accurate relation of planes and angles, with hairline fit of contacting members.
- F. Fasteners: Conceal fasteners.
- G. Provide EPDM/vinyl blade gasket weatherstripping in bottom exterior door rail, adjustable for contact with threshold.
- H. At interior doors and other locations without weatherstripping, provide neoprene silencers on stops to prevent metal-to-metal contact.
- I. Provisions shall be made in the framing for minimum edge clearance, nominal edge cover, and nominal pocket width for the thickness and type of glazing installed, and shall be in accordance with the FGMA Glazing Manual.
- J. Pocket glazed framing shall provide:

	<u>Single Glass</u>	<u>Insulating Glass</u>
1. Nominal edge cover (or bite) framing only	5/16"	1/2"
2. Min. nominal edge clearance	1/8"	1/4"
3. Min. face clearance	1/8"	5/32"

2.5 STOREFRONT FRAMING

- A. General: Provide inside-outside matched resilient flush glazed system with provisions for glass replacement. Shop fabricate and preassemble frame components where possible.
- B. Thermal-Break Construction: Fabricate exterior aluminum storefront framing system with integrally concealed, low conductance thermal barrier, located between exterior materials and exposed interior members, in manner which eliminates direct metal-to-metal contact. Provide manufacturer's standard construction which has been in use for similar projects for at least three years.
- C. Glazing: Type GL-03; see Section 08 80 00, Glazing.

2.6 ALUMINUM DOORS

- A. Aluminum entrance doors shall be ultra narrow stile factory-glazed thermally broken aluminum doors, manufactured by same manufacturer as storefront framing.
- B. Aluminum entrance doors shall be stile and rail type swing doors. Aluminum shall be extruded aluminum conforming to ASTM B 221, 0.125" thick for door stiles and 0.050" thick for glazing molding.
 - 1. Sections shall be of sizes and profiles indicated; shall present straight, sharply defined lines and arrises; and shall be free from defects impairing strength, durability, and appearance.



2. Fasteners where exposed shall be aluminum, stainless steel, or plated steel conforming to ASTM A 164.
 - C. Glazing: Type GL-03; see Section 08 80 00, Glazing.
 - D. Each door shall be factory glazed set in neoprene glazing gasket.
 - E. Doors shall meet the following resistance to corner racking when tested by the Dual Moment Load Test.
 1. Test section shall consist of a standard top door corner assembly. Side rail section shall be 24" long and top rail section shall be 12" long.
 2. Anchor top rail positively to test bench so that corner protrudes 3" beyond bench edge.
 3. Anchor a lever arm positively to side rail at a point 19" from inside edge of top rail. Attach weight support pad at a point 19" from inner edge of side rail.
 4. Test section shall withstand a load of 235 lbs. on the lever arm before reaching the point of failure, which shall be considered a rotation of the lever arm in excess of 45 deg.
 - F. Air Infiltration (applies only to single acting offset pivot or butt hung entrances): Air infiltration shall be tested in accordance with ASTM E 283, at a pressure differential of 1.567 psf. A single 3'-0" x 7'-0" entrance door and frame shall not exceed 0.50 cfm per linear foot of perimeter crack. A pair of 6'-0" x 7'-0" entrance doors and frame shall not exceed 1.0 cfm per linear foot of perimeter crack.
 - G. For door hardware, refer to Section 08 71 00, Door Hardware.
 - H. Door bottom rail of exterior doors shall have an EPDM blade gasket sweep strip applied with concealed fasteners.
 - I. Corner construction shall consist of mechanical clip fastening, SIGMA deep penetration and fillet welds. Glazing stops shall be hook-in type with EPDM glazing gaskets.
 - J. The door weatherstripping on a single acting offset pivot or butt hung exterior door and frame (single or pairs) shall be thermoplastic elastomer weatherstripping on a tubular shape with a semi-rigid polymeric backing.
 - K. The door weatherstripping on a double acting, center pivoted door and frame (single or pairs) shall be pile cloth. The door bottom rail shall be weatherstripped with an EPDM blade gasket sweep strip applied with concealed fasteners.
 - L. The meeting stiles on pairs of doors shall be equipped with an adjustable astragal.
- 2.7 FINISH
- A. 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 INSTALLATION

- A. Install aluminum entrance doors and storefront framing in openings prepared under other Sections plumb, square, level, in exact alignment with surrounding work, with proper clearances, and securely and positively anchored to building structure, to meet performance requirements specified herein, in accordance with manufacturer's published instructions and approved submittals.
- B. Use only skilled mechanics for erection, under supervision of manufacturer's representative.
- C. Provide protection against galvanic action. Isolate dissimilar materials with bituminous coating or non-absorptive dielectric tape.
- D. Install aluminum entrance doors, storefront frame, and finish hardware. Carefully fit and adjust doors and hardware to frames and weatherstripping. After erection check and adjust operating hardware for smooth and proper operation.
- E. Set continuous sill members and flashing in a full sealant bed to provide weathertight construction, unless otherwise indicated. Comply with requirements of Section 07 92 00, Joint Sealants.
- F. Erection Tolerances: Install entrance and storefront systems to comply with the following maximum tolerances.
 - 1. Variation from Plane: Limit variation from plane or location shown to 1/8" in 12 feet; 1/4" over total length.
 - 2. Alignment: Where surfaces abut in line, limit offset from true alignment to 1/16". Where surfaces meet at corners, limit offset from true alignment to 1/32".
 - 3. Diagonal Measurements: Limit difference between diagonal measurements to 1/8".

3.3 PROTECTION AND CLEANING

- A. Protect finished metal surfaces from damage during fabrication, shipping, storage, and erection, and from then until acceptance by the City of New York.
- B. Clean metal surfaces promptly after installation, exercising care to avoid damage. Remove excess sealant, dirt, and other substances. Lubricate hardware and other moving parts.
- C. Clean glass surfaces promptly after installation, exercising care to avoid damage to same.

END OF SECTION 08 41 13



SECTION 08 41 26 - ALL-GLASS 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. All-glass vestibule wall.
 - 2. All-glass inner vestibule entry doors.
 - 3. All-glass partition at Teen Area.

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: For each type of product specified. Include details of construction relative to materials, dimensions of individual components, profiles, and finishes.
- C. Shop Drawings; Show details of fabrication and installation, including the following:
 - 1. Plans, elevations, and sections.
 - 2. Detail sections of rail fittings.
 - 3. Anchorages and reinforcement.
 - 4. Glazing details.
- D. Samples for Verification: Of size indicated below and of same thickness and material indicated for Work. Show the full range of color and texture variations expected.
 - 1. Metal Finishes: 6-inch long sections of rails, and other items.
 - 2. Glass: 6 inches square showing exposed-edge finish.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

1.5 PERFORMANCE REQUIREMENTS

- A. Deflection Normal to Glazing Plane: Limited to 1/175 of clear span or 3/4", whichever is smaller.



1.6 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during, and after installation, and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify opening dimensions of all-glass entrances by field measurements before fabrication and indicate measurements on Shop Drawings.

1.8 WARRANTY

- A. Submit a written warranty executed by the manufacturer agreeing to repair or replace components of all-glass doors and partitions that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, the following:
 - 1. Structural failures.
 - 2. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 3. Failure of operating components to function normally.
- B. Warranty Period: 2 years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Teen Area All Glass Wall - Basis-of-Design Product: Subject to compliance with requirements, provide CRL; CRL Blumcraft Wet Glaze U-Channel for 3/4" Tempered Glass, 1-1/4" x 7/8", Satin Anodized, or comparable product by one of the following:
 - 1. Virginia Glass Products Corp.
 - 2. NanaWall
 - 3. Or approved equal.
- B. Vestibule All Glass Wall - Basis-of-Design Product: Subject to compliance with requirements, provide CRL; CRL Wide U-Channel for 3/4" Glass, 2-1/8" x 1-5/8", Satin Anodized, or comparable product by one of the following:
 - 1. Virginia Glass Products Corp.
 - 2. Nanawall
 - 3. Or approved equal.
- C. Entry Doors - Basis-of-Design Product: Subject to compliance with requirements, provide CRL; CRL All Glass Entrance System with CRL 10" Square Shape Full Length Dry Glaze Door Rails, Satin Anodized, or comparable product by one of the following:



1. Virginia Glass Products Corp.
2. NanaWall
3. Or approved equal.

2.2 MATERIALS

- A. Glazing: Type GL-04; see Section 08 80 00, Glazing.
- B. Aluminum: ASTM B221, with strength and durability characteristics of not less than Alloy 6063-T5.
 1. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

2.3 COMPONENTS

- A. Fittings: Provide continuous rail fittings and accessories for all-glass entrances of configurations shown on drawings fabricated of aluminum.
- B. Anchors and Fastenings: Manufacturer's standard concealed anchors and fastening.

2.4 FABRICATION

- A. General: Fabricate all-glass entrance components in sizes, profiles, and configurations indicated.
 1. Provide holes and cutouts in glass to receive rails, and accessories before tempering glass. Do not cut, drill, or make other alterations to glass after tempering.
 2. Fully temper glass using horizontal roller hearth process.
 3. Factory assemble components and factory install hardware to greatest extent possible.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. Install all-glass doors, partitions, and associated components according to manufacturer's written instructions.
- B. Set units level and plumb.
- C. Maintain uniform clearances between adjacent components.

3.3 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer, that ensure all glass doors and partitions are without damage or deterioration.

END OF SECTION 08 41 26



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. Aluminum and glass curtain wall assemblies.
2. Operable window sash set in curtain wall.
3. Glass and glazing in conjunction with the work of this Section.
4. All necessary steel or aluminum members where required to support, strengthen and/or reinforce aluminum members.
5. Sealants, caulking, joint fillers, gaskets, fasteners, vents and weeps, weep tubes, bellows, closures, gutters, end dams, flashings, trim, as shown or as may be required in conjunction with the system or to join the system to adjacent construction.
6. Anchors, inserts and insert setting diagrams, furnishing of inserts and insert setting diagrams, support brackets, reinforcing, bracing, stiffeners, flashing.
7. Shop drawings engineering calculations, erection drawings, samples and conformance test data.
8. Field check for water leakage.
9. Protection and cleaning, as defined herein.
10. Field measurements of adjacent and/or supporting construction and verification of existing conditions.

B. Related Sections

1. Section 04 20 00 "Unit Masonry"
2. Section 07 21 00 "Thermal Insulation"
3. Section 07 92 00 "Joint Sealants"
4. Section 08 41 13 "Aluminum-Framed Entrances and Storefronts"
5. Section 08 80 00 "Glazing" for glazing other than in conjunction with the metal work of this Section.
6. Section 08 90 00 "Louvers and Vents"



1.3 PERFORMANCE REQUIREMENTS

- A. General Performance: Comply with performance requirements specified, as determined by manufacturer's documented performance criteria and field 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 shall withstand movements of supporting structure 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.
- B. Engineering Services: Engineer glazed aluminum curtain walls, including comprehensive engineering analysis by a Professional Engineer licensed in the State of New York, including, but not limited to story drift, twist, column shortening, long term creep, using performance requirements and design criteria indicated. Submit for review and approval by the Commissioner.
- C. Design Wind loads (unless greater by Code): See Structural Drawings.
- D. Structural-Test Performance: Test according to ASTM E 330 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, and permanent deformation of main framing members exceeding 0.2 percent of span.
 - 3. Test Durations: As required by design wind velocity, but not less than 10 seconds.
- E. 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 $L/175$ 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 $L/360$ of clear span or 1/8 inch, whichever is smaller.
 - 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, limit deflection to two times the length of cantilevered member, divided by 175.



- F. Seismic Performance: Glazed aluminum curtain walls shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.
- G. Water Penetration under Static Pressure: No evidence of water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 15 lbf/sq. ft.
- H. Water Penetration under Dynamic Pressure: No evidence of water penetration through fixed glazing and framing areas when tested according to AAMA 501.1 at dynamic pressure equal to 20 percent of positive wind-load design pressure, but not less than 15 lbf/sq. ft.
 - 1. Maximum Water Leakage: No uncontrolled water penetrating assemblies or water appearing on assemblies' normally exposed interior surfaces from sources other than condensation. Water leakage does not include water controlled by flashing and gutters that is drained to exterior.
- I. Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures:
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
 - 2. Test Interior Ambient-Air Temperature: 75 deg F.
 - 3. Test Performance: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5.
- J. Energy Performance: Comply with the 2016 New York City Energy Conservation Code (NYCECC). Glazed aluminum curtain walls shall have certified and labeled energy performance ratings in accordance with National Fenestration Rating Council, Inc. (NFRC).
 - 1. Thermal Transmittance (U-factor)
 - a. Fixed fenestration shall have U-factor of not more than 0.23 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
 - b. Operable fenestration shall have U-factor of not more than 0.39 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
 - c. Entrance doors shall have U-factor of not more than 0.33 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
 - 2. Solar Heat Gain Coefficient (SHGC): 0.27.
 - 3. Air Infiltration: Maximum air leakage through fixed glazing and framing areas of 0.30 cfm/sq. ft. of fixed wall area as determined according to ASTM E 283 at a minimum static-air-pressure differential of 6.24 lbf/sq. ft.
 - 4. Condensation Resistance: Fixed glazing and framing areas shall have an NFRC certified condensation resistance rating of no less than 65 as determined according to NFRC 500.
- K. Sound Transmission: Provide glazed aluminum curtain walls with fixed glazing and framing areas having the following sound-transmission characteristics:



1. Outdoor-Indoor Transmission Class: Minimum 30 when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 1332.
- L. Dimensional Tolerances: Provide glazed aluminum curtain wall system, including anchorage, that accommodates dimensional tolerances of building frame and other adjacent construction.
- M. Operable Sash: Operable projecting out window sash shall conform to the following criteria:
 1. AP-AW-90 of AAMA 101/I.S.2, 2008.
 2. 'U' value of not more than 0.39.
 3. CRI value of not less than 52.
 4. SHGC: 0.27

1.4 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Submit Product Data for each product specified, including details of construction relative to materials, dimensions of individual components, profiles, and finishes.
- C. Submit Shop Drawings showing fabrication and installation of glazed aluminum curtain wall system including plans, elevations, sections, details of components, and attachments to other units of Work.
 1. For installed products indicated to comply with certain design loadings, include structural analysis data signed and sealed by a professional engineer licensed in the State of New York responsible for their preparation.
- D. Submit samples for verification of each type of exposed finish required in manufacturer's standard sizes. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.
- E. Submit cutaway sample of each vertical-to-horizontal intersection of system, made from 12-inch lengths of full-size components and showing details of the following:
 1. Joinery.
 2. Anchorage.
 3. Expansion provisions.
 4. Glass and glazing.
 5. Flashing and drainage.
- F. Submit welder certificates indicating that welders comply with requirements specified in "Quality Assurance" Article.
- G. Submit installer certificates signed by manufacturer certifying that installers comply with requirements in "Quality Assurance" Article.



- H. Submit product test reports from a qualified independent testing agency evidencing compliance of glazed aluminum curtain wall system with requirements based on comprehensive testing of manufacturer's current system.
- I. Submit test reports, calculations, computer analysis and other necessary data from a qualified independent inspecting and testing agency retained by the Contractor indicating compliance with performance requirements of glazed aluminum curtain wall system.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Testing Agency Qualifications: To qualify for approval, an independent testing agency must demonstrate to Commissioner's satisfaction, based on 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 the Work.
- C. Professional Engineer Qualifications: A professional engineer licensed 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 glazed aluminum curtain wall systems that are similar to those indicated for this Project in material, design, and extent.
- D. Installer Qualifications: Engage an experienced installer to perform work of this Section who has specialized in installing glazed aluminum curtain wall systems similar to those required for this Project and who is acceptable to the manufacturer.
 - 1. Engineering Responsibility: Engage a qualified professional engineer to prepare or supervise the preparation of data for glazed aluminum curtain wall systems, including drawings, testing program development, test-result interpretation, and comprehensive engineering analysis that shows systems' compliance with specified requirements.
- E. Source Limitations: Obtain each type of glazed aluminum curtain wall system from one source and by a single manufacturer.
- F. Product Options: Information on Drawings and in Specifications establishes requirements for 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 sight lines and relationships 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, or in-service performance.
 - 1. Do not modify intended aesthetic effects, as judged solely by Commissioner, except with Commissioner's approval and only to the extent needed to comply with performance requirements. Where modifications are proposed, submit comprehensive explanatory data to Commissioner for review.
- G. Welding Standards: Comply with applicable provisions of AWS D1.2, "Structural Welding Code--Aluminum."



1. Engage welders who have satisfactorily passed AWS qualification tests for welding processes involved and who are currently certified for these processes.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions by field measurements before fabrication and show recorded measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabrication without field measurements. Coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions.

1.7 WARRANTY

- A. Manufacturer's Warranty: Submit a written warranty executed by the manufacturer agreeing to repair or replace components of a glazed aluminum curtain wall system that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, the following:

1. Structural failures including, but not limited to, excessive deflection.
2. Noise or vibration caused by thermal movements.
3. Failure of system to meet performance requirements.
4. Failure of operating components to function normally.
5. Water leakage.
6. Glazing breakage.

- B. Warranty Period: 10 years from date of Substantial Completion (except as noted below).

- C. Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Warranty Period: 20 years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Wausau Window and Wall Systems; HP-Wall Series curtain wall with 4250-Z Zero Sightline operable windows with Multi-Lock hardware or comparable product by one of the following:



1. Vistawall Architectural Products
2. EFCO Corporation
3. Kawneer Company, Inc.
4. Or approved equal.

2.2 METALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated, complying with the requirements of standards indicated below.
 1. Sheet and Plate: ASTM B 209.
 2. Extruded Bars, Rods, Shapes, and Tubes: ASTM B 221.
 3. Extruded Structural Pipe and Tubes: ASTM B 429.
 4. Structural Profiles: ASTM A 1008.
 5. Welding Rods and Bare Electrodes: AWS A5.10.
- 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, Plats, and Bars: ASTM A 36.
 2. Cold Rolled Sheet and Strip: ASTM A 1008.
 3. Hot Rolled Sheet and Strip: ASTM A 1011.

2.3 FRAMING

- A. Framing Members: Extruded or formed aluminum framing members of thickness required and reinforced as required to support imposed loads.
 1. Construction: Thermally broken.
 2. Glazing System: Retained mechanically with gaskets on four sides.
 3. Glazing Plane: Front.
- B. Brackets and Reinforcements: Manufacturer's standard high strength aluminum with non-staining, non-ferrous shims for aligning system components.
- C. Fasteners and Accessories: Manufacturer's standard corrosion resistant, non-staining, non-bleeding 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. Anchors: Three way adjustable anchors with minimum adjustment of 2" that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
1. Concrete and Masonry Inserts: Hot dip galvanized cast iron, malleable iron, or steel inserts complying with ASTM A 123 or ASTM A 153 requirements.

2.4 GLASS

- A. Glass shall be of the types and minimum thickness, as shown on the drawings and specified herein, and shall, in addition, meet the requirements of the following paragraphs.
- B. All glass shall be the manufactured product of one (1) company. All fabricated glass products shall be the fabricated and coated products of one (1) company. All glass shall be delivered to the site bearing the manufacturer's label, complete with glazing instructions where applicable.
- C. Insulating glass units shall be 1" thick (minimum), consisting of two lites of 1/4" (minimum) glass separated by a desiccant filled metal spacer with welded, fused, soldered or bent corners and welded, fused or soldered splices or joints to provide a 1/2" hermetically sealed and dehydrated space. Insulating glass shall be dual seal and certified for compliance with seal classification "CBA" by the Insulating Glass Certification Council (IGC) and tested in accordance with the following ASTM Test methods. Secondary seal on structural silicone glazed units shall be a special silicone edge seal certified for use in structural silicone glazing applications over the temperature range and structural loading as called for under the performance criteria section of this Specification.
1. ASTM E 2190 Standard Specification for Insulating Glass Unit Performance and Evaluation.
 2. ASTM E 546-88 Standard Test Method for Frost Point of Sealed Insulating Glass Units.
 3. ASTM E 576-88 Standard Test Method for Dew/Frost Point of Sealed Insulating Glass Units in Vertical Position.
- D. The lites comprising insulating glass units shall be annealed, heat strengthened, (or fully tempered where required to meet wind load or safety glazing requirements), as shown, specified, required, or recommended by the specified glass fabricator to ensure against heat breakage and to ensure adequate glass performance at the specified design pressures specified under the performance criteria herein.
- E. Glass shall conform to the requirements of ASTM C 1036. Heat strengthened and tempered glass shall conform to the requirements of ASTM C 1048. Tempered glass shall also conform to ANSI Z97.1-1975. All heat strengthening and tempering shall be by the horizontal process, and processed in such a manner as to have all roller distortion in a horizontal direction as installed on the building.



- F. Fully tempered glass shall be heat soaked to EN 14179-1:2005-European Heat Soaking Standard. Glass manufacturer shall submit for approval their proposal for meeting this requirement. Heat soaked panes shall be marked to show they have been heat soaked.
- G. Where glass manufacturer cannot ensure adequate structural performance of insulating glass units, based upon combination of inner/outer lite, assume outer lite alone must satisfy structural requirements. Method of installation must be in accordance with the manufacturer's published literature, as well as the latest standards of the FGMA and SIGMA. Method of installation shall make provision to weep all sill glazing rabbets.
- H. Contractor shall provide certification from glass producer/fabricator that glass producer/fabricator has reviewed all glazing details and thicknesses and finds same suitable for the purpose intended in accordance with these specifications. This shall include a written wind load and thermal stress analysis showing a probability of failure of no greater than 8 lites per thousand for conventional glazing and 4 lites per thousand for structural silicone glazing at the design loads and local climatic thermal conditions.
- I. Glass producer/fabricator shall make regular inspections (maximum interval semi-monthly) of glazing work in progress at the point of glazing for both mock-up and job production units to verify that glazing is proceeding in accordance with his recommendations. Glass producer/fabricator shall attend the mock-up test.
- J. Insulating glass units shall be installed in such manner as to adequately drain the glazing rabbet in a manner, as approved in writing, by the insulating unit glass manufacturer.
- K. Contractor shall include in his design provision for reglazing vision lites with access from the interior except for structurally glazed lites which shall be reglazed from the exterior. Mock-up shall include lites shop glazed in the initial installation as well as field glazed in the replacement mode.
- L. Glass deflection at full design load shall be limited to the lesser of $L/100$ or $3/4"$. In event specified glass cannot meet these requirements, Contractor shall submit calculations establishing anticipated deflections and reduction in glass bite as a consequence of deflections, along with his drawings. Submittal shall include a statement from glass manufacturer/fabricator that reduction in glass bite will not result in a reduction in load resistance capacity, an increase in breakage probability and that all specified warranties shall remain in effect.
- M. Glazing: Types GL-01, GL-02 and GL-03; see Section 08 80 00, Glazing.

2.5 GASKETS/WEATHERSTRIPPING

- A. All gaskets and weather stripping shall be neoprene, except where used in contact with a silicone sealant. In contact with silicone sealants, gaskets and spacers shall be preformed, heat-cured, silicone rubber, chemically compatible with the silicone sealant and suitable for the specific purpose intended or equal, as recommended by the sealant manufacturer and approved by the Commissioner. All gaskets, weather stripping, and spacers shall have continuous mechanical engagement to framing members; adhesive attachment is not acceptable. All weather strips and gaskets shall be continuous with vulcanized/molded corners where possible.
- B. Sponge gaskets/weatherstripping/spacers shall be extruded black neoprene or silicone rubber (or equal as provided for in 2.4 A) with a hardness of 40 ± 5 durometer Shore A and conform to ASTM C 509-79 (for neoprene). Sponge gaskets shall be compressed 20% to 35% in the final installed position.



- C. Dense gaskets/weatherstripping shall be extruded black neoprene conforming to NAAMM SG-1-70 or silicone rubber (or equal as provided for in 2.04 A) with a hardness of 75 + 5 durometer Shore A for hollow profiles and 60 + 5 for solid profiles.

2.6 SEALANTS (NON-STRUCTURAL)

- A. All joints, which are sealed with sealant as part of the fabrication or erection procedure, shall be sealed with an approved butyl (concealed) or low modulus silicone (exposed or concealed) sealant in color to match the adjoining surfaces or as may be required by the Commissioner. All perimeter sealant (metal to adjacent construction) shall be low or medium modulus silicone sealant. Silicone sealant shall be as manufactured by General Electric, Dow Corning, or Pecora or approved equal. Butyl sealant shall be PTI 707.
- B. In using specified sealants, strictly observe the printed instructions of sealant manufacturer regarding joint size, limitations, backer rod, mixing, cleaning, surface preparation, priming and application. A primer shall be used, unless printed instructions advise to the contrary, and sealant manufacturer certifies that the use thereof will reduce its performance. Sealant shall not be applied when substrates are wet or when the temperature is below 40 deg. F.
- C. Care shall be exercised to ensure against "Three Surface Adhesion." Bond breakers shall be provided where necessary.
- D. Contractor shall provide certification from sealant manufacturer that the sealant manufacturer has reviewed all sealant details and finds same suitable for the purpose intended, compatible with and will not stain the surfaces with which they are in contact. Statement as to compatibility, adhesion sufficiency and non-staining shall be accompanied by actual test results on production substrates performed in accordance with applicable ASTM procedures.

2.7 SEALANTS (STRUCTURAL)

- A. All components which are adhered with a structural silicone sealant/adhesive as part of the fabrication, glazing or erection procedure, shall be sealed/adhered with an approved structural silicone, as manufactured by General Electric, Dow Corning or Pecora or approved equal. All glazing with structural silicone sealant/adhesive shall be accomplished in a shop.
- B. In using specified sealants, strictly observe the printed instructions of sealant manufacturer regarding joint size, limitations, backer rod, mixing, cleaning, surface preparation, priming and application. A primer shall be used, unless printed instructions advise to the contrary. Sealant shall not be applied when substrates are wet or when the temperature is below 40 deg. F. Units shall not be moved until structural silicone seal has achieved full cure.
- C. Care shall be exercised to ensure against "Three Surface Adhesion." Bond breakers shall be provided where necessary.
- D. Contractor shall provide certification from sealant manufacturer that the sealant manufacturer has reviewed all sealant details and tested all contact surfaces, and finds same suitable for use with proposed sealant, the purpose intended and compatible with the surfaces with which they are in contact. Sealant manufacturer's certification shall include the following based upon tests performed on production run materials:
 - 1. Test data of adhesion to production samples of metal and glass, tested in accordance with ASTM C 794.



2. Compatibility statement that the materials in contact with the sealant such as gaskets, spacers, setting blocks, are compatible with the sealant after 21 days exposure to ultra violet, 2000 - 4000 (micro watt UV radiation).
 3. Stress statement that when exposed to the specified wind load the stress in the silicone sealant of dimensions shown does not exceed 20 psi with a safety factor of 6:1.
- E. Where silicone bonds to a metal or glass surface, the weakest element in the line of stress must have a minimum strength of 120 psi. For each combination of substrates submit report from an independent laboratory for tests performed in the following manner:
1. Assemble and fully cure a minimum of 6 samples using actual substrates and a minimum sample length of 5".
 2. Subject sample to a tensile load such that nominal stress on silicone is 20 psi, hold for one minute and remove load. Repeat for additional loadings, increasing nominal silicone stress by 20 psi with each successive loading. Continue until failure occurs or until 200 psi is successfully applied.
 3. All 6 samples must successfully withstand at least 120 psi. Report maximum stress and mode of failure. If one or more samples do not meet this criterion, revise failed element and repeat tests with 6 new samples. Repeat until all 6 samples are successfully tested.
 4. Testing shall be performed in such a manner as to establish stress and safety factor over the temperature range described herein.
 5. Prepare an outline for a quality assurance program for evaluation of adhesion and other physical attributes of sealants and submit to Commissioner for review and approval.
 6. Program shall cover both initial testing of components for sealant adhesion/compatibility, etc., and also random testing of production run materials, etc. Include testing at full negative design pressure, one unit per one hundred units manufactured for the project. Also include methods which will be employed to monitor sealant application to ensure full sealant contact. No sealant work shall be performed prior to approval of program.

2.8 GLAZING BLOCKS

- A. Provide setting blocks at the sill quarter points of all glass lites. Setting blocks shall be black dense neoprene or heat cured silicone rubber with a hardness of 80 to 90 durometer, Shore A, a minimum length of 4", and a minimum width, which will permit full support of both panes of glass in an insulating glass unit or a monolithic unit no matter how positioned within the glazing rabbet.
- B. Shims used in conjunction with setting blocks must be of the same materials, hardness, length and width as the setting blocks.
- C. Provide side blocks within the upper half of both jambs of all glass lites. Side blocks shall be black dense neoprene or heat cured silicone rubber with a 60 to 70 durometer, Shore A, or as recommended by the selected glass manufacturer. Provide 1/8" clearance between block and bearing surface.



2.9 MISCELLANEOUS MATERIALS

- A. Provide straps, plates and brackets, built-in inserts, as required for support and anchorage of the fabricated items to adjacent surfaces.
- B. Where steel reinforcement of units is required for strength or other unavoidable necessity and concealed within (encased) in aluminum sections or employed in potentially wetted areas, hot dip galvanize the pieces after fabrication with 2.0 ounce zinc coating, complying with ASTM A 123. All other steel reinforcement shall be coated with two (2) heavy coats of zinc rich primer in differing colors.
- C. Slip Joint Linings/Sleeves: Provide stainless steel sleeve spacers and/or suitable bearing pads, as required, to ensure free movement between surfaces where expansion and deflection movements are intended. Provide "Eel Slip," "Nylatron" or high impact polystyrene shims or pads or equivalent plastic units of sizes and thicknesses (minimum 1/16" except 1/8" for "Eel Slip") recommended by the manufacturer to permanently prevent "freeze up" of joints. All sleeves, spacers, bracing pads and shims must be incombustible and rated by UL.
- D. Flashing required within the system shall be 26 ga. stainless steel.
- E. Flashing required to join the system to adjacent construction shall be 26 ga. stainless steel.
- F. Operable Sash Hardware: Provide the following:
 - 1. Multi-point locking system for single handle operation.
 - 2. Concealed stainless steel 4-bar hinges.
 - 3. Limit stop as directed by the Commissioner.
 - 4. Pivot shoe roto-operator.

2.10 THERMAL BREAK

- A. Provide thermal break or thermally improved construction, complying with the requirements of these Specifications and which have been in service on comparable installations for no less than three (3) years. Submit data to prove structural sufficiency over full exterior thermal range specified, and anticipated wind loading. In the event a structural thermal break is employed, manufacturer shall establish structural properties over full thermal range.

2.11 FABRICATION

- A. General: Fabricate glazed aluminum curtain wall system according to Shop Drawings. 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.
- B. Forming: Form shapes with sharp profiles, straight and free of defects or deformations, before finishing.
- C. Prepare components to receive concealed fasteners and anchor and connection devices.



- D. Fabricate components to drain water passing joints, condensation occurring in glazing channels, condensation occurring within framing members, and moisture migrating within the system to the exterior.
- E. Welding: Weld components to comply with referenced standard and Shop Drawings, unless otherwise indicated. Weld before finishing components. 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.
- F. Glazing Pockets: Provide minimum clearances for thickness and type of glass indicated according to GANA's "Glazing Manual."
- G. Glazing Pockets: Provide minimum clearances for thickness and type of plastic sheet indicated according to plastic sheet manufacturer's recommendations.
- H. 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.
- I. Frame Units: Factory assemble frame units according to Shop Drawings to greatest extent possible. Rigidly secure non-movement joints. Seal joints watertight, unless otherwise indicated. Assemble components to drain water passing joints, condensation occurring in glazing channels, condensation occurring within framing members, and moisture migrating within the system to the exterior.
 - 1. Install glazing according to approved Shop Drawings.
- J. All machining, cutting and welding shall be done before finish is applied.

2.12 ALUMINUM FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
- 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 the 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. High-Performance Organic Finish, Two-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat.
 - 1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 2. Custom color and gloss as selected by the Commissioner.



PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. General: Comply with manufacturer's written instructions for protecting, handling, and installing glazed aluminum curtain wall system. Do not install damaged components. Fit joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints. Seal joints watertight, unless otherwise indicated. Provide means to drain water to the exterior to produce a permanently weatherproof system.
- 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. Install components to drain water passing joints, condensation occurring in glazing channels, condensation occurring within framing members, and moisture migrating within the system to the exterior.
- D. Install framing members plumb and true in alignment with established lines and grades.
- E. Install factory-assembled frame units plumb and true in alignment with established lines and grades.
- F. Install column covers plumb and true in alignment with established lines and grades.
- G. Anchorage: After system components are positioned, fix connections to building structure as indicated on Shop Drawings.
 - 1. Provide separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
- H. Welding: Weld components to comply with referenced standard and Shop Drawings, unless otherwise indicated. Weld in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
- I. Install glazing according to approved Shop Drawings.
- J. Install sealant according to approved Shop Drawings. Comply with requirements of Section 07 92 00, "Joint Sealants."
- K. Erection Tolerances: Install glazed aluminum curtain wall system to comply with the following maximum tolerances:
 - 1. Plumb: 1/16" in 10 feet; 1/8" in 40 feet.
 - 2. Level: 1/16" in 20 feet; 1/8" in 40 feet.
 - 3. Alignment: Where surfaces abut in line, limit offset from true alignment to 1/16"; where a reveal or protruding element separates aligned surfaces by less than 2", limit offset to 1/4".



4. Location: Limit variation from plane or location shown on Shop Drawings to 1/8" in 12 feet; 1/4" over total length.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor shall engage a qualified independent testing agency to perform testing indicated.
- B. Static air infiltration test(s) as well as the static pressure water test(s) shall be performed on 8 sq feet to determine if curtain wall meets performance requirements specified herein in Article 1.3.
- C. Test for water infiltration per AAMA 501.2. Test within the first 10% of work complete, area to be a minimum of 100 SF of wall and including a perimeter where curtain wall adjoins masonry construction. Interior finishes must not interfere with observation of test area or be removed from test area. Not appropriate for operable windows and doors.
 1. This test (AAMA 501.2) shall be performed infield on new construction.
- D. Repair or remove Work that does not meet requirements or that is damaged by testing; replace to conform to specified requirements.

3.4 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure glazed aluminum curtain wall system is without damage or deterioration at the time of Substantial Completion.

END OF SECTION 08 44 13



THIS PAGE INTENTIONALLY LEFT BLANK

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: Finish Hardware for door openings, except as otherwise specified herein.
1. Door hardware for steel (hollow metal) doors.
 2. Door hardware for aluminum doors.
 3. Door hardware for wood doors.
 4. Door hardware for other doors indicated.
 5. Keyed cylinders as indicated.
- B. Related Sections:
1. Section 06 10 00 Rough Carpentry.
 2. Section 08 41 13 Aluminum-Framed Entrances and Storefronts
 3. Section 08 11 13 Hollow Metal Doors and Frames.
 4. Section 08 14 16 Flush Wood Doors
- C. References: Comply with applicable requirements of the following standards. Where these standards conflict with other specific requirements, the most restrictive shall govern.
1. Builders Hardware Manufacturing Association (BHMA)
 2. NFPA 101 Life Safety Code
 3. NFPA 80 -Fire Doors and Windows
 4. ANSI-A156.xx- Various Performance Standards for Finish Hardware
 5. UL10C – Positive Pressure Fire Test of Door Assemblies
 6. ANSI-A117.1 – Accessible and Usable Buildings and Facilities
 7. DHI /ANSI A115.IG – Installation Guide for Doors and Hardware

1.3 SUBMITTALS:

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."
- B. Product Data: Manufacturer's specifications and technical data including the following:
1. Detailed specification of construction and fabrication.
 2. Manufacturer's installation instructions.
 3. Wiring diagrams for each electric product specified. Coordinate voltage with electrical before submitting.



4. Submit 6 copies of catalog cuts with hardware schedule.
- C. Shop Drawings - Hardware Schedule: Submit 6 complete reproducible copy of detailed hardware schedule in a vertical format.
 1. List groups and suffixes in proper sequence.
 2. Completely describe door and list architectural door number.
 3. Manufacturer, product name, and catalog number.
 4. Function, type, and style.
 5. Size and finish of each item.
 6. Mounting heights.
 7. Explanation of abbreviations and symbols used within schedule.
 8. Detailed wiring diagrams, specially developed for each opening, indicating all electric hardware, security equipment and access control equipment, and door and frame rough-ins required for specific opening.
- D. Templates: Submit templates and "reviewed Hardware Schedule" to door and frame supplier and others as applicable to enable proper and accurate sizing and locations of cutouts and reinforcing.
 1. Templates, wiring diagrams and "reviewed Hardware Schedule" of electrical terms to electrical for coordination and verification of voltages and locations.
- E. Samples: (If requested by the Commissioner)
 1. 1 sample of lever and rose/escutcheon design, (pair).
 2. 3 samples of metal finishes
- F. Contract Closeout Submittals: Comply with DDC General Conditions including specific requirements indicated.
 1. Operating and maintenance manuals: Submit 3 sets containing the following.
 - a. Complete information in care, maintenance, and adjustment, and data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Name, address, and phone number of local representative for each manufacturer.
 - d. Parts list for each product.
 2. Copy of final hardware schedule, edited to reflect, "As installed".
 3. Copy of final keying schedule, to be approved by client prior to finalization.
 4. As installed "Wiring Diagrams" for each piece of hardware connected to power, both low voltage and 110 volts.
 5. One set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."



1. Distributor's Qualifications: Firm with 3 years experience in the distribution of commercial hardware.
 - a. Distributor to employ full time Architectural Hardware Consultants (AHC) for the purpose of scheduling and coordinating hardware and establishing keying schedule.
 - b. Hardware Schedule shall be prepared and signed by an AHC.
 2. Installer's Qualifications: Firm with 3 years experienced in installation of similar hardware to that required for this Project, including specific requirements indicated.
 3. Regulatory Label Requirements: Provide testing agency label or stamp on hardware for labeled openings.
 - a. Provide UL listed hardware for labeled and 20 minute openings in conformance with requirements for class of opening scheduled.
 - b. Underwriters Laboratories requirements have precedence over this specification where conflict exists.
 4. Single Source Responsibility: Except where specified in hardware schedule, furnish products of only one manufacturer for each type of hardware.
- B. Review Project for extent of finish hardware required to complete the Work. Where there is a conflict between these Specifications and the existing hardware, notify the Commissioner in writing and furnish hardware in compliance with the Specification unless otherwise directed in writing by the Commissioner
- 1.5 DELIVERY, STORAGE, AND HANDLING
- A. Packing and Shipping: Comply with DDC General Conditions.
1. Deliver products in original unopened packaging with legible manufacturer's identification.
 2. Package hardware to prevent damage during transit and storage.
 3. Mark hardware to correspond with "reviewed hardware schedule".
 4. Deliver hardware to door and frame manufacturer upon request.
- B. Storage and Protection: Comply with manufacturer's recommendations.
- 1.6 PROJECT CONDITIONS:
- A. Coordinate hardware with work of other trades. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for the proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents.
- B. Review Shop Drawings for doors and entrances to confirm that adequate provisions will be made for the proper installation of hardware.

1.7 WARRANTY:

A. Manufacturer's Warranty:

1. Closers: Ten years
2. Exit Devices: Three Years
3. Locksets & Cylinders: Three years
4. All other Hardware: Two years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. The following manufacturers are approved subject to compliance with requirements of the Contract Documents.

<u>Item:</u>	<u>Manufacturer, Basis of Design</u>	<u>Additional Manufacturers:</u>
Hinges	Stanley	Bommer, Hager, or approved equal
Locksets	Corbin Russwin	Schlage, Yale or approved equal
Key Pad Lock	Schlage	(no substitutions)
Cylinders	Yale	(no substitutions)
Exit Devices	Von Duprin	Falcon, Stanley or approved equal
Exit Devices (Entry Door)	Blumcraft	Falcon, Stanley or approved equal
Closers	Dorma	Stanley, LCN or approved equal
Floor Closers, Pivots	Dorma	Rixon, LCN or approved equal
Power Supply	Von Duprin	same manufacturer as exit device
Push/Pull Plates	Blumcraft	Allegion, Doorware or approved equal
Protection Plates	Trimco	Rockwood, Burns, or approved equal
Door Stops	Trimco	Rockwood, Burns, or approved equal
Threshold & Gasketing	Legacy Mfg.	Guard, Zero, or approved equal
Key Control Cabinet	Lund	Barska, Kekab, or approved equal

2.2 MATERIALS:

A. Hinges:

1. Template screw hole locations
2. Minimum of 2 permanently lubricated non-detachable bearings
3. Equip with easily seated, non-rising pins
4. Sufficient size to allow 180-degree swing of door
5. Furnish hinges with five knuckles and concealed bearings
6. Provide hinge type as listed in schedule.
7. Furnish 3 hinges per leaf to 7 foot 6 inch height. Add one for each additional 30 inches in height or fraction thereof.
8. Tested and approved by BHMA for all applicable ANSI Standards for type, size, function and finish
9. UL10C listed for Fire



B. Mortise Type Locks and Latches:

1. Tested and approved by BHMA for ANSI A156.13, Series 1000, Operational Grade 1, Extra-Heavy Duty, Security Grade 2 and be UL10C
2. Fit ANSI A115.1 door preparation
3. Functions and design as indicated in the hardware groups
4. Solid, one-piece, 3/4-inch (19mm) throw, anti-friction latchbolt made of self-lubricating stainless steel
5. Deadbolt functions shall have 1 inch (25mm) throw bolt made of hardened stainless steel
6. Latchbolt and Deadbolt are to extend into the case a minimum of 3/8 inch (9.5mm) when fully extended
7. Auxiliary deadlatch to be made of one-piece stainless steel, permanently lubricated
8. Provide sufficient curved strike lip to protect door trim
9. Lever handles must be of forged or cast brass, bronze or stainless-steel construction and conform to ANSI A117.1. Levers that contain a hollow cavity are not acceptable
10. Lock shall have self-aligning, thru-bolted trim
11. Levers to operate a roller bearing spindle hub mechanism
12. Mortise cylinders of lock shall have a concealed internal setscrew for securing the cylinder to the lockset. The internal setscrew will be accessible only by removing the core, with the control key, from the cylinder body.
13. Spindle to be designed to prevent forced entry from attacking of lever
14. Provide locksets with 7-pin removable and interchangeable core cylinders
15. Each lever to have independent spring mechanism controlling it
16. Core face must be the same finish as the lockset
17. Provide (5) keys per cylinder
18. Provide a biting chart from manufacturer showing depth of cuts of all keys for replacement purposes

C. Exit Devices shall:

1. Tested and approved by BHMA for ANSI 156.3, Grade 1
2. Provide a deadlocking latchbolt
3. Non-fire rated exit devices shall have cylinder dogging.
4. Touchpad shall be "U" style for entry door and "T" style for all others.
5. Exposed components shall be of architectural metals and finishes.
6. Lever design shall match lockset lever design
7. Provide strikes as required by application.
8. Fire exit devices to be listed for UL10C
9. UL listed for Accident Hazard
10. Shall consist of a cross bar or push pad, the actuating portion of which extends across, shall not be less than one half the width of the door leaf.

D. Cylinders:

1. Provide the necessary cylinder housings, collars, rings & springs as recommended by the manufacturer for proper installation.



2. Provide the proper cylinder cams or tail piece as required to operate all locksets and other keyed hardware items listed in the hardware sets.
 3. Coordinate and provide as required for related sections.
 4. Provide (5) keys per cylinder
 5. Provide a biting chart from manufacturer showing depth of cuts of all keys for replacement purposes
- E. Door Closers shall:
1. Tested and approved by BHMA for ANSI 156.4, Grade 1
 2. The sweep period of the closer shall be adjusted so that from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 in (75 mm) from the latch, measured to the leading edge of the door.
 3. The maximum force for pushing or pulling open a door shall be as follows:
 - a. Fire doors shall have the minimum opening force allowable by the NYC Building Code.
 - b. Other doors:
 - i. exterior hinged doors: 8.5 lbf
 - ii. interior hinged doors: 5 lbf (22.2N)
 - iii. sliding or folding doors: 5 lbf (22.2N)
 4. If automatic door closer is used it shall comply with ANSI/BHMA A156.10-1984.
 5. UL10C certified
 6. Closer shall have extra-duty arms and knuckles
 7. Conform to ANSI 117.1
 8. Maximum 2 7/16 inch case projection with non-ferrous cover
 9. Separate adjusting valves for closing and latching speed, and backcheck
 10. Provide adapter plates, shim spacers and blade stop spacers as required by frame and door conditions
 11. Full rack and pinion type closer with 1½" minimum bore
 12. Mount closers on non-public side of door, unless otherwise noted in specification
 13. Closers shall be non-handed, non-sized and multi-sized.
- F. Door Stops: Provide a dome floor or wall stop for every opening as listed in the hardware sets.
1. Wall stop and floor stop shall be heavy-duty wrought brass or stainless steel.
 2. Provide fastener suitable for wall construction.
 3. Coordinate reinforcement of walls where wall stop is specified.
 4. Provide dome stops where wall stops are not practical. Provide spacers or carpet riser for floor conditions encountered
- G. Seals: All seals shall be finished to match adjacent frame color. Seals shall be furnished as listed in schedule. Material shall be UL listed for labeled openings.
- H. Weatherstripping: Provide at head and jambs only those units where resilient or flexible seal strip is easily replaceable. Where bar-type weatherstrip is used with parallel arm mounted closers install weatherstrip first.
1. Weatherstrip shall be resilient seal of (Neoprene, Polyurethane, Vinyl, Pile, Nylon Brush, Silicone)
 2. UL10C Positive Pressure rated seal set when required.

- I. Door Bottoms/Sweeps: Surface mounted or concealed door bottom where listed in the hardware sets.
 - 1. Door seal shall be resilient seal of (Neoprene, Polyurethane, Nylon Brush, Silicone)
 - 2. UL10C Positive Pressure rated seal set when required.
- J. Thresholds: Thresholds shall be aluminum beveled type with maximum height of ½" for conformance with ADA requirements. Furnish as specified and per details. Provide fasteners and screws suitable for floor conditions.
- K. Silencers: Furnish silencers on all interior frames, 3 for single doors, 2 for pairs. Omit where any type of seals occurs.
- L. Kick Plates: Furnish .050" thick heavy duty kick plates at all interior doors for push and pull sides. Install with countersunk stainless-steel screws.
- M. Key Control System: Provide heavy gauge steel wall-mount key cabinet large enough to accommodate all keys of all doors, mechanical equipment and furniture keys with 50% spare. Matte grey finish. Verify precise key capacity, locking mechanism (key or combination lock) and color with commissioner.

2.3 FINISH:

- A. Designations used in Schedule of Finish Hardware - 3.5, and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 including coordination with traditional U.S. finishes shown by certain manufacturers for their products
- B. Powder coat door closers to match other hardware, unless otherwise noted.
- C. Aluminum items shall be finished to match predominant adjacent material. Seals to coordinate with frame color.

2.4 KEYS AND KEYING:

- A. Provide keyed brass construction cores and keys during the construction period. Construction control and operating keys and core shall not be part of the City of New York's permanent keying system or furnished in the same keyway (or key section) as the City of New York's permanent keying system. Permanent cores and keys (prepared per the approved keying schedule, sequentially numbered and supplied with key tags) will be furnished directly to the City of New York.
- B. Cylinders, removable and interchangeable core system: Yale 7-pin. No substitutions.
- C. Permanent keys and cores: Stamped with the applicable key mark for identification. These visual key control marks or codes will not include the actual key cuts. Permanent keys will also be stamped "Do Not Duplicate."
- D. Transmit permanent keys and cores, Grand Masterkeys, Masterkeys and other Security keys to the Commissioner by Registered Mail, return receipt requested.
- E. Furnish keys in the following quantities:



1. Grand Masterkey: 1 each
 2. Masterkeys: 4 each
 3. Change keys each keyed core: 5 each
 4. Construction masterkeys: 15 each
 5. Control keys: 1 each
- F. The City of New York will install permanent cores and return the construction cores to the Hardware Supplier.
- G. Keying Schedule: Arrange for a keying and programming meeting with Commissioner and hardware supplier, and other involved parties to ensure locksets and locking hardware, are functionally correct and keying and programming complies with project requirements. Furnish 3 typed copies of keying and programming schedule to Commissioner.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

- A. Verification of conditions: Examine doors, frames, related items and conditions under which Work is to be performed and identify conditions detrimental to proper and or timely completion.
1. Do not proceed until unsatisfactory conditions have been corrected.

3.3 HARDWARE LOCATIONS:

- A. Mount hardware units at heights indicated in the following publications except as specifically indicated or required.
1. Recommended Locations for Builder's Hardware for Standard Steel Doors and Frames, by the Door and Hardware Institute (DHI).
 2. Recommended locations for Architectural Hardware for flush wood doors (DHI).
 3. WDMA Industry Standard I.S.-1A-04, Industry Standard for Architectural wood flush doors.

3.4 INSTALLATION:

- A. Install each hardware item per manufacturer's instructions and recommendations. Do not install surface mounted items until finishes have been completed on the substrate. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- B. Install Conforming to ICC/ANSI A117.1 Accessible and Usable Building and Facilities.



1. Adjust door closer sweep periods so that from the open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the landing side of the door.

- C. Installed hardware using the manufacturers fasteners provided. Drill and tap all screw holes located in metallic materials. Do not use "Riv-Nuts" or similar products.

3.5 FIELD QUALITY CONTROL AND FINAL ADJUSTMENT

- A. Contractor/Installers, Field Services: After installation is complete, contractor shall inspect the completed door openings on site to verify installation of hardware is complete and properly adjusted, in accordance with both the Contract Documents and final shop drawings.

1. Check and adjust closers to ensure proper operation.
2. Check latchset, lockset, and exit devices are properly installed and adjusted to ensure proper operation.
 - a. Verify levers are free from binding.
 - b. Ensure latchbolts and dead bolts are engaged into strike and hardware is functioning.
3. Report findings, in writing, to Commissioner indicating that all hardware is installed and functioning properly. Include recommendations outlining corrective actions for improperly functioning hardware if required.

3.6 SCHEDULE OF FINISH HARDWARE:

- A. The below Schedule lists the Basis of Design hardware. Additional manufacturers and approved equals are listed in Article 2.1.

Manufacturer List

<u>Code</u>	<u>Name</u>
BE	Best Access Systems
BL	Blumcraft
BY	By Others
CR	Corbin Russwin
DM	Dorma Door Controls
DX	Deltrex USA
FA	Folger Adam Inc.
LM	Legacy Mfg.
SC	Schlage
SE	Sedco
ST	Stanley
TR	Trimco
YA	Yale
VD	Von Duprin



Finish List

<u>Code</u>	<u>Description</u>
AL	Aluminum
US28	Aluminum
626	Satin Chromium Plated
628	Satin Aluminum, Clear Anodized
630	Satin Stainless Steel
689	Aluminum Painted
US10	Dull Bronze
US26D	Chromium Plated, Dull
US32D	Stainless Steel, Dull
OB	Oil Rubbed Bronze
DBAA	Dark Bronze Anodized Aluminum
PC	Powder Coated Finish

Hardware Sets

HARDWARE SET A.1 (Exterior Glass Entry Doors):

1	Floor Closer	BTS80 series	626	DM
1	Automatic Operator	ED400IG series	626	DM
2	Exit Device	H100-F	630	BL
2	Masterkeyed Cylinder	(to suit)	626	YA
2	Temporary Core	(to suit)	626	BE
2	Permanent Core	(to suit)	626	YA
1	set Weatherstripping	(by door manufacturer)		
2	Overhead Stops	Dorma 910S series	626	DM
1	Saddle	Legacy Mfg. (as detailed on drawings)		
1	Electric Strike	310-1 x FSE	630	FA
2	Wall Actuators	59R4-HSS	630	SE
1	Power Supply	(by Division 28)		
1	Door Contact	(by Division 28)		
1	Card Reader	(by Division 28)		set Wiring Diagrams

NOTE: During normal operation, doors are dogged. Inside and outside wall actuators signal automatic operator to open doors. When doors are locked, card reader on non-secure side of door unlocks electric strike and outside wall actuator which then signals automatic operator to open door, inside wall actuator unlocks electric strike and signals automatic operator to open door. Free egress on the secure side of the door. Door position switch monitors door position. Coordinate electrical requirements with related trades and sections.

HARDWARE SET A.2 (Interior Glass Entry Doors):

1	Floor Closer	BTS80 series	626	DM
1	Automatic Operator	ED400IG series	626	DM



2	set Push Pulls	DH100-F	630	BL
2	Overhead Stops	Dorma 910S series	626	DM
1	Saddle	Legacy Mfg. (as detailed on drawings)		
2	Wall Actuators	117	630	DX

NOTE: Inside and outside wall actuators signal automatic operator to open doors. Coordinate electrical requirements with related trades and sections.

HARDWARE SET A.3 (All Other Exterior Doors):

1	Electric Continuous Hinge	1019-LPT	CA	LM
1	Electric Exit Device	QEL9875NL	626	VD
1	Masterkeyed Cylinder	(to suit)	626	BE
1	Temporary Core	(to suit)	626	YA
1	Permanent Core	(to suit)	626	YA
1	Closer/Stop	8616-DS-FC	689	DM
1	set Weatherstripping	Legacy Mfg. 5924CA jambs/head	CA	LM
1	Door Bottom	Legacy Mfg. 7553MA	MA	LM
1	Saddle	Legacy Mfg. (as detailed on drawings)		
1	Power Supply	PS900 series		VD
1	Door Contact	(by Division 28)		
1	Card Reader	(by Division 28)		
1	set Wiring Diagrams	(by Division 28)		

NOTE: Card Reader on non-secure side unlocks electric exit device. Free egress on the secure side. Door position switch monitors door position. Coordinate electrical requirements with related trades and sections.

HARDWARE SET B.1 (Janitor, Staff Storage – in swinging):

3	Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1	Storeroom Lock	ML2057 x LWA x WSB	630	CR
1	Masterkeyed Cylinder	(to suit)	626	YA
1	Door Stop	W1211	630	TR
1	Kick Plate	K0050 x 10"h x 2" LDW x B3E	630	TR
3	Silencers	1229A	GRY	TR

HARDWARE SET B.2 (Community, Custodial, Elec and IT Rooms – in swinging):

2	Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1	Electric Hinge	6 wire (to match)	26D	ST
1	Electric Lock	ML20906-SEC x LWA x WSB x M92 x LC	630	CR
1	Masterkeyed Cylinder	(to suit)	626	YA
1	Temporary Core	(to suit)	626	YA
1	Permanent Core	(to suit)	626	BE
1	Closer/Stop	8616-DS-FC	689	DM
1	Kick Plate	K0050 x 10"h x 2" LDW x B3E	630	TR
1	set Smoke Seals	Legacy Mfg. 5884S-BK jambs/head	BK	LM
1	Power Supply	(by Division 28)		
1	Door Contact	(by Division 28)		
1	Card Reader	(by Division 28)		

1 set Wiring Diagrams (by Division 28)

Note: Omit kick Plate at Acme Doors.

NOTE: Card Reader on non-secure side unlocks electric lock. Free egress on the secure side. RX switch in electric lock shunts alarm. Door position switch monitors door position. Coordinate electrical requirements with related trades and sections.

HARDWARE SET B.3 (Staff Break Rm, Staff Offices):

3	Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1	Storeroom Lock	ML2057-LWA-LC x SA114-M17	630	CR
1	Masterkeyed Cylinder	(to suit)	626	YA
1	Closer/Stop	Dorma 8616-IS-FC	689	DM
1	Kick Plate	K0050 x 10"h x 2" LDW x B3E	630	TR
3	Door Silencers	1229A	GRY	TR

HARDWARE SET B.4 (Activity):

3	Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1	Classroom Lock	ML2055-LWA-LC x SA114-M17	630	CR
1	Masterkeyed Cylinder	(to suit)	626	YA
1	Closer	Dorma 8616-AF-FC (REG ARM)	689	DM
1	Door Stop	W1211	630	TR
3	Door Silencers	1229A	GRY	TR

HARDWARE SET B.5 (Mechanical – in swinging):

3	Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1	Storeroom Lock	ML2057-LWA-LC x SA114-M17	630	CR
1	Masterkeyed Cylinder	(to suit)	626	YA
1	Closer	Dorma 8616-AF-FC (REG ARM)	689	DM
1	Door Stop	W1211	630	TR
1	Kick Plate	K0050 x 10"h x 2" LDW x B3E	630	TR
1	set Sound Seals	5078CA jambs/head	CA	LM
1	Door Bottom	7553MA	MA	LM

HARDWARE SET B.5 (Custodial Storage – in swinging):

3	Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1	Storeroom Lock	ML2057 x LWA x WSB	630	CR
1	Masterkeyed Cylinder	(to suit)	626	YA
1	Overhead Stop	Dorma 710S series	626	DM
1	Kick Plate	K0050 x 10"h x 2" LDW x B3E	630	TR
3	Silencers	1229A	GRY	TR

HARDWARE SET C.1 (All Public Toilets):

3	Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1	Key Pad Lock	C0-200-CY-70-KP-TLR	626	SC
1	Masterkeyed Cylinder	(to suit)	626	YA
1	Temporary Core	(to suit)	626	YA
1	Permanent Core	(to suit)	626	YA

1	Privacy Deadbolt	B571 x Indicator	626	SC
1	Door Closer	8616-F-FC (REG ARM)	689	DM
1	Door Stop	W1211	630	TR
1	Kick Plate	K0050 x 10"h x 2" LDW x B3E	630	TR
3	Silencers	1229A	GRY	TR

HARDWARE SET C.2 (All Staff Toilets):

3	Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1	Privacy Set	ML2030-LWA-M19V x SA114-M17	630	SR
1	Door Closer	8616-F-FC (REG ARM)	689	DM
1	Door Stop	1270WV	630	TR
1	Kick Plate	K0050 x 10"h x 2" LDW x B3E	630	TR
3	Silencers	1229A	GRY	TR

HARDWARE SET D.1 (Activity to Kitchenette):

1	Top Track	C1-12 (size to suit)	--	CO
1	Component Pack	C100-010	--	CO
1	Soft Close	C30-613	--	CO
1	Bottom Guide	C44-371	--	CO
1	set Pulls	7200P x BTB	630	AL

Note: Bottom of door to be notched for bottom guide.

HARDWARE SET D.2 (Community to Kitchenette):

1	Top Track	C1-12 (size to suit)	--	CO
1	Component Pack	C100-010	--	CO
1	Soft Close	C30-613	--	CO
1	Bottom Guide	C44-371	--	CO
1	Pocket Door Lock	2001ADAP-3	626	AL
1	Masterkeyed Cylinder	(to suit)	626	YA

Note: Bottom of door to be notched for bottom guide.

HARDWARE SET E.1 (Managers Office Glass Door):

3	Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1	Office Lock	ML2051-LWA-LC x SA114-M17	630	CR
1	Masterkeyed Cylinder	(to suit)	626	YA
1	Door Stop	W1211	630	TR
3	Door Silencers	1229A	GRY	TR

END OF SECTION 08 71 00



THIS PAGE LEFT INTENTIONALLY BLANK



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 glazing of the following:
 - 1. Windows.
 - 2. Doors.
 - 3. Curtain wall assemblies.
 - 4. Entrances and storefront framing.
 - 5. Interior borrowed lites.
 - 6. Interior frameless mirrors.
- B. Related Sections
 - 1. Section 08 11 13 "Hollow Metal Doors and Frames"
 - 2. Section 08 41 13 "Aluminum-Framed Entrances and Storefronts"
 - 3. Section 08 44 13 "Glazed Aluminum Curtain Walls"
 - 4. Section 10 28 13 "Toilet Accessories" for framed bathroom mirrors.

1.3 REFERENCES

- A. Comply with the recommendations of the following references unless more stringent requirements are indicated herein.
 - 1. FGMA Publications: FGMA Glazing Manual.
 - 2. LSGA Publications: LSGA Design Guide.
 - 3. SIGMA Publications: TM-3000 Vertical Glazing Guidelines.
 - 4. Safety Glass: Products complying with ANSI Z97.1 and testing requirements of 16 CFR Part 1201, Safety Standards for Architectural Glazing, Sealed Insulating Glass Manufacturing Association.



5. Fire-Resistive Glazing Products for Door Assemblies: Products identical to those tested per ASTM E 152, labeled and listed by UL or another testing and inspecting agency acceptable to the Commissioner.
6. ASTM C 920, Elastomeric Joint Sealant.
7. Insulating Glass Criteria: IGCC International Glass Certification Council.

1.4 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: Submit manufacturer's printed product data, specifications, standard details, installation instructions, use limitations and recommendations for each material used. Provide certifications that materials and systems comply with specified requirements, including performance requirements.
- C. Submit compatibility and adhesion test reports from sealant manufacturer indicating materials were tested for compatibility and adhesion with glazing sealant, as well as other glazing materials including insulation units.
- D. Initial Selection Samples: Submit samples of each glass and glazing material showing complete range of colors, textures, and finishes available for each material used.
 1. Submit complete range of samples of standard colors and patterns for ceramic frits at insulating glass.
 2. Submit complete range of samples of sandblasted glass showing variations of grits and opacity achieved.
- E. Verification Samples: Submit representative samples of each glass and glazing material that is to be exposed in completed work. Show full color ranges and finish variations expected. Provide glass samples having minimum size of 144 sq. in. and 6 in. long samples of sealants and glazing materials; all samples shall bear the name of the manufacturer, brand name, thickness, and quality.
- F. Calculations: Provide wind load charts, calculations, thermal stress analysis, and certification of performance of this work. Indicate how design requirements for loading and other performance criteria have been satisfied. Document shall be signed and sealed by a Professional Engineer licensed in the State of New York.
- G. Test Reports: Provide certified reports for specified tests.
- H. Warranties: Provide written warranties as specified herein.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Source: For each glass and glazing type required for work of this Section, provide primary materials which are products of one manufacturer. Provide secondary or accessory materials which are acceptable to manufacturers of primary materials.



- C. Glass Thickness: Glass thicknesses shown on drawings and/or specified herein are minimum thicknesses. Determine and provide size and thickness of glass products that are certified to meet or exceed performance requirements specified in this Section.
- D. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated.
 - 1. GANA Publications: GANA's "Glazing Manual" and "Laminated Glass Design Guide."
 - 2. IGMA Publications: IGMA TM-3000, "Vertical Glazing Guidelines for Sealed Insulating Glass Units."
- E. Glazing for Fire-Rated Door Assemblies: Glazing for assemblies that comply with NFPA 80 and that are listed and labeled by a testing and inspecting agency acceptable to the Commissioner, for fire-protection ratings indicated, based on testing according to NFPA 252.
- F. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201.
 - 1. Subject to compliance with requirements, obtain safety glazing products permanently marked with certification label of the Safety Glazing Certification Council.
 - 2. Where glazing units, including Kind FT glass and laminated glass, are specified in Part 2 articles for glazing lites more than 9 sq. ft. in exposed surface area of one side, provide glazing products that comply with Category II materials, for lites 9 sq. ft. or less in exposed surface area of one side, provide glazing products that comply with Category I or II materials, except for hazardous locations where Category II materials are required by 16 CFR 1201 and regulations of the New York City Building Code.
- G. Insulating Glass Certification Program: Permanently marked on spacers with appropriate certification label of the following testing and inspecting agency:
 - 1. Insulating Glass Certification Council.
 - 2. Associated Laboratories, Inc.
 - 3. Insulating Glass Manufacturers Alliance.

1.6 PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Glass Design: Glass thicknesses indicated on drawings and/or specified herein are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
 - 1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:



- a. Specified Design Wind Loads: 30 psf or greater if required by New York City Building Code.
2. Probability of Breakage for Vertical Glazing:
 - a. 8 lites per 1000 for lites set vertically or not more than 15 degrees off vertical and under wind action.
 - b. 1 lite per 1000 for lites installed 15 degrees from the vertical and under wind action.
 - c. Load Duration: 60 seconds or less.
3. Maximum Lateral Deflection: For glass supported on all four edges, provide thickness required that limits center deflection at design wind pressure to 1/100 times the short side length or 1/2", whichever is less.
4. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - a. Temperature Change (Range): 120 deg. F ambient; 180 deg F, material surfaces.
5. Thermal Solar Performance: See Article 2.2 herein.
- C. Glass units shall be annealed, heat strengthened, fully tempered or laminated where required to meet wind load and safety glazing requirements, as shown, specified, or recommended by the glass fabricator, and as required by the New York City Building Code.

1.7 TESTS

- A. Preconstruction Sealant Test: Submit samples of materials to be used to glazing sealant manufacturer to determine sealant compatibility. Include samples of glass, gaskets, glazing materials, framing members, and other components and accessories of glazing work. Test in accordance with ASTM C 794 to verify what type of primers (if any) are required to ensure sealant adhesion to substrates.
 1. Submit minimum of nine pieces of each type and finish of framing member, and nine pieces of each type, class, kind, condition, and form of glass, including monolithic, laminated, and insulating glass for adhesion tests.
 2. Provide manufacturer's written report and recommendations regarding proper installation.

1.8 PROJECT CONDITIONS

- A. Weather: Perform work of this Section only when existing or forecasted weather conditions are within limits established by manufacturers of materials and products used.
- B. Temperature Limits: Install sealants only when temperatures are within limits recommended by sealant manufacturer, except, never install sealants when temperatures are below 40 deg. F.

1.9 WARRANTIES

- A. General: Warranties shall be in addition to, and not a limitation of, other rights the City of New York may have under the Contract Documents.



- B. **Manufacturer's Warranty on Coated Glass Products:** Provide written warranty signed by manufacturer of coated glass agreeing to furnish f.o.b. point of manufacture, within specified warranty period indicated below, replacements for those coated glass units which develop manufacturing defects.
1. **Warranty Period:** Manufacturer's standard but not less than five (5) years after date of Substantial Completion.
- C. **Manufacturer's Warranty on Insulating Glass:** Provide written warranty signed by manufacturer of insulating glass agreeing to furnish f.o.b. point of manufacture, freight allowed project site, within specified warranty period indicated below, replacements for those insulating glass units developing manufacturing defects, provided the manufacturer's instructions for handling, installing, protecting and maintaining units have been complied with during the warranty period.
1. **Warranty Period:** Manufacturer's standard but not less than ten (10) years after date of Substantial Completion.
- D. **Manufacturer's Warranty on Laminated Glass:** Manufacturer's standard form, made out to the City of New York and signed by laminated glass manufacturer agreeing to replace laminated glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
1. **Warranty period** five (5) years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS/FABRICATORS

- A. All glass and glazing used at the exterior of the Project shall be manufactured by the same manufacturer. The same manufacturer and the same furnace shall be used for all tempered and heat strengthened glass used throughout the project.
- B. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
1. PPG Industries.
 2. Guardian Industries.
 3. Pilkington.
 4. AFG.
 5. JE Berkowitz, LP.
 6. Viracon.
 7. Or approved equal.

2.2 GLASS MATERIALS AND PRODUCTS

- A. **Ultra-Clear (Low-Iron) Glass:** Class I (clear); with a minimum 91 percent visible light transmission and a minimum solar heat gain coefficient of 0.87.



1. Low Iron Tempered Glass: Low iron glass, tempered in accordance ASTM C 1048, thicknesses as indicated.
 - a. Basis of Design Product: Subject to compliance with requirements, provide PPG; Starphire or comparable product by one of the following:
 - 1). Pilkington
 - 2). Saint Gobain
 - 3). Or approved equal.
- B. Float Glass: ASTM C 1036, Type I (transparent, flat), Class 1 (clear) or Class 2 (tinted) as indicated, Quality q3, minimum 1/4" thick.
- C. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality q3. Fabricate by horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
- D. Tempered Glass: ASTM C 1048, Condition A (uncoated), Type I (transparent, flat), Class 1 (clear) or Class 2 (tinted) as indicated, Quality q3, Kind FT, minimum 1/4" thick. Tempered glass must be certified by SGCC to meet applicable standards.
 1. Performance Requirements for Tempered Glass
 - a. Length and Width: For 2.9 mm to 6.0 mm; +/-1.6 mm.
 - b. Diagonal: +/- 3.0 mm.
 - c. Edgework: Belt seaming or diamond wheels. 1.5 mm seam of upper and lower glass edges. No sharp edges.
 - d. Corners: No more than 3.0 mm from square.
 - e. Float Glass Defects: Must meet the requirements of ASTM C 1036. The most common defects are scratches, stones gaseous bubbles and edge chips. Tables in the glass standards have limits for size/quantity of defects.
 - f. Tempered glass shall have a minimum surface compression of 10,000 psi.
 - g. Tempered glass to be heat-treated by horizontal (roller hearth) process with inherent roller-wave distortion parallel to the bottom edge of the glass when installed.
 - h. Flatness Tolerances
 - 1). Roller-Wave or Ripple: The deviation from flatness at any peak shall be targeted not exceed 0.003" as measured per peak to valley for 1/4" (6mm) thick glass.
 - 2). Bow and Warp: The bow and warp tolerances shall not exceed 1/32" per linear foot.
 - 3). Fully tempered glass shall be heat soaked to EN 14179-1:2005-European Heat Soaking Standard.
- E. Laminated Safety Glass: Provide two glass panes of equal thickness, laminated together with a polyvinyl butyl interlayer, conforming to ASTM C 1172 and as follows:
 1. Interlayer Color: Clear.
 2. Interlayer Materials
 - a. PVB Interlayers: Eastman Chemical "Saflex" or "Vanceva," DuPont "Butacite," or approved equal, 0.030" thick at vertical applications, and 0.060" thick at sloped or horizontal applications.



- b. Ionoplast Interlayer: Dupont "SentryGlas Plus," or approved equal.
- 3. Minimum thickness of 1/4".
- F. Insulating Glass: Provide insulating glass units of composition indicated in the Material Index - Exterior. Provide factory assembled units of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space, complying with ASTM E 2190, and as follows:
 - 1. Sealing System: Dual Seal.
 - 2. Primary Sealant: Polyisobutylene.
 - 3. Secondary Sealant: Silicone, General Electric IGS 3204 or IGS 3100, or Dow Corning 982.
 - a. For structurally glazed IG units, secondary seal shall conform to ASTM C 1249.
 - b. Primary and secondary seals shall not contain voids and must be continuously bonded to the glass structure.
 - 4. Spacer: Clear finish aluminum with welded, soldered, or bent corners, hollow tube types, filled with low nitrogen absorption desiccant unless otherwise noted.
 - 5. Desiccant: Molecular sieve, silica gel, or blend of both.
 - 6. Interspace Content: Argon unless otherwise noted.
 - 7. Glass Thickness: 1/4" minimum.
 - 8. Low 'E' Coating: Provide high-performance, clear, metallic coating as indicated in Glass Types.
 - a. Manufacturers: Subject to compliance with requirements, provide product by one of the following:
 - 1). Viracon
 - 2). PPG
 - 3). Guardian
 - 4). Or approved equal.
 - 9. Units shall be certified for compliance with seal classification "CBA" by the Insulating Glass Certification Council (IGCC) or by IGMA, and tested in accordance with the above ASTM Test Methods.
 - 10. Insulating glass shall conform to the following tolerances:
 - a. Length and Width: + 3.0 mm/ -2.0 mm.
 - b. Diagonal: +/- 3.0 mm.
 - c. Thickness: As agreed +/- 1.0 mm.
 - d. Edge-Deletion of Coating: Minimum 8 mm wide. Width of deletion must be more than the width of the secondary seal. Silver layer(s) must be completely removed. Appearance must be uniform.



- e. Primary PIB Seal: Must be complete with no breaks. Appearance must be uniform. PIB bead must overlap coating. No visible bright line when glass is viewed in transmission. The width of the PIB bead shall be 4.0 mm + 3.0/ - 1.5 mm.
 - f. Secondary Seal: Nominal 6 mm + 3.0/ - 1.5 mm. The minimum width of the secondary silicone seal for IG units that are glazed structurally must be determined according to ASTM C 1249. The secondary seal must be uniformly applied without bubbles, cavities or gaps. Avoid excess sealant that will need to be trimmed off later.
11. Additional requirements and properties for primary and secondary insulating glass seals and spacers:
- a. All glass units shall comply with IGMA Guidelines which limits the dimension of the visible edge seal encroachment into the vision area to be no greater than the sightline infringement of 3mm (0.12").
 - b. Insulating glass unit hermetic seal to consist of butyl primary and silicone secondary seals with bent, welded, or soldered interpane spacer corners; keyed corners are not acceptable unless also soldered or welded. Spacers shall be aluminum or stainless steel. Locate spacer joint at the top or sides of the units, but in no instances at the sill. Design units to minimize the number of spacer joints. Provide solid keys, embedded in butyl sealant on all four sides, at spacer joints.
 - c. Hermetic seals must be continuous and intimately bonded to both lites of glass. Provide primary seal of uniform depth with a nominal width of 1/8" to 3/16". Hermetic seals shall not be contaminated with debris, fingerprints, or other foreign matter and shall not contain voids or air pockets that decrease the width of the seal below the minimum widths listed in these Specifications, or that breach the seal. The width of the primary seal shall not be less than 1/16", and the total cumulative length of the primary seal between 1/16" and 1/8" shall be less than 12" in any one insulating glass unit. The primary seal shall not have a reduced thickness at the corners. An increased thickness of the primary seal at the corners is acceptable.
 - d. Provide secondary seal of uniform depth with a nominal width of 1/4". Provide a total width of the primary and secondary seal of 1/2". Units shall carry CBA rating as established by ASTM E 774 and shall meet SIGMA 65-7-2, latest edition. Units shall not contain breather or capillary tubes or similar penetrations.
- G. Frameless Mirrors: 1/4", Quality q2, clear float glass with silver, copper, and organic coating, edges uniformly ground and polished.
- H. Glass Types
- 1. GL-01: Triple Glazing, Clear
 - 2. GL-02: Triple Glazing, Acid Etch
 - 3. GL-03: Insulated Glazing for Operable Windows, Entry Doors and Sidelites
 - 4. GL-04: Laminated Glass, single layer
 - 5. GL-05: 1/4" tempered glass



2.3 GLAZING MATERIALS AND PRODUCTS

- A. General: Provide sealants and gaskets with performance characteristics suitable for applications indicated. Ensure compatibility of glazing sealants with insulating glass sealants, with laminated glass interlayers, and with any other surfaces in contact.
- B. General Glazing and Cap Bead Sealant: Provide sealant with maximum Shore A hardness of 50.
 - 1. Product: Subject to compliance with requirements, provide one of the following:
 - a. Dow Corning; 795.
 - b. General Electric; Silglaze N 2500 or Contractors SCS-1000.
 - c. Tremco; Spectrem 2.
 - d. Or approved equal.
- C. Weather Seal Sealant: Provide non-acid curing sealant with movement range $\pm 50\%$, ASTM C 719.
 - 1. Product: Subject to compliance with requirements, provide one of the following:
 - a. Dow Corning; 795.
 - b. General Electric Silpruf.
 - c. Tremco; Spectrem 2.
 - d. Or approved equal.
- D. Backer Rod: Closed-cell, non-gassing polyethylene rod with rod diameter 25% wider than joint width.
- E. Dense Elastomeric Compression Seal Gaskets: Provide molded or extruded neoprene or EPDM gaskets, Shore A hardness of 75 ± 5 for hollow profile, and 60 ± 5 for solid profiles, ASTM C 864.
- F. Cellular, Elastomeric Preformed Gaskets: Provide extruded or molded closed cell, integral-skinned neoprene, Shore A 40 ± 5 , and 20% to 35% compression, ASTM C 509; Type II.
- G. Preformed Glazing Tape: Provide solvent-free butyl-polyisobutylene rubber with 100% solids content complying with ASTM C 1281 AAMA A 800 with integral continuous EPDM shim. Provide preformed glazing tape in extruded tape form.
- H. Setting Blocks: Provide 100% silicone blocks with Shore A hardness of 80-90. Provide products certified by manufacturer to be compatible with silicone sealants. Length to be not less than 4". Width for setting blocks to be 1/16" more than glass thickness and high enough to provide the lite recommended by glass manufacturer. When thickness of setting block exceeds 3/4" the glass manufacturer must be consulted for sizes and configuration. In a vented system, setting block shall be designed so as to not restrict the flow of water within the glazing rabbet to the weep holes.
 - 1. Shims: For shims used with setting blocks, provide same materials, hardness, length and width as setting blocks.
 - 2. Structural Silicone Glazing: Provide silicone setting blocks where structural silicone occurs at sills and at insulating units with silicone edge seals.
- I. Edge Blocks: Provide neoprene or silicone as required for compatibility with glazing sealants. Provide blocks with Shore A hardness of 55 ± 5 .



- J. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place.
- K. Miscellaneous Glazing Materials: Provide sealant backer rods, primers, cleaners, and sealers of type recommended by glass and sealant manufacturers.
- L. Mirror Adhesive: Adhesive mastic for adhering glass plate. Mastic must be compatible with mirror backing.
 - 1. Clips: No. 4 finish Type 304 stainless steel.

2.4 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing standard, to comply with system performance requirements.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites in a manner that produces square edges with slight kerfs at junctions with indoor and outdoor faces.
- C. Grind smooth and polish exposed glass edges.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

- A. Examine framing glazing, 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 system.
 - 3. Minimum required face or 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.

3.4 GENERAL GLAZING STANDARDS

- A. Install products using the recommendations from the manufacturer of glass, sealants, gaskets and other glazing materials, except where more stringent requirements are indicated, including those in the GANA "Glazing Manual."



- B. Verify that Insulating Glass Unit (IGU) secondary seal is compatible with glazing sealants.
- C. Install glass in prepared glazing channels and other framing members.
- D. Install setting blocks in rabbets as recommended by referenced glazing standards in GANA's "Glazing Manual" and IGMA's "Glazing Guidelines."
- E. Provide bite on glass, minimum edge and face clearances and glazing material tolerances recommended by GANA's "Glazing Manual."
- F. Provide weep system as recommended by GANA's "Glazing Manual."
- G. Set glass lites in each series with uniform pattern, draw, bow and similar characteristics.
- H. Distribute the weight of glass unit along the edge rather than the corner.
- I. Comply with manufacturers and referenced industry standards on expansion joint and anchors; accommodating thermal movement; glass openings; use of setting blocks, edge, face, and bite clearances; use of glass spacers; edge blocks and installation of weep systems.
- J. Protect glass edge damage during handling and installation.
- K. Prevent glass from contact with contaminating substances that result from construction operations, such as weld spatter, fireproofing or plaster.
- L. Remove and replace glass that is broken, chipped cracked or damaged in any way.

3.5 GLAZING

- A. Glazing channel dimensions, as indicated on Shop Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
- 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 is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate 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. Install setting blocks at the one greater points of each lite along the horizontal mullion.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where the length plus width is larger than 50 inches as follows:
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.



2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- 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.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- J. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.
- K. Flush Glazing
 1. If the butt joint in the metal framing is in the vertical direction, the glazier shall run the tape initially on the head and sill members going directly over this joint. Should the butt joint in the metal framing run horizontally, tapes must first be applied to the jambs so that it crosses over the joint.
 2. Each tape section shall butt the adjoining tape and be united with a tool to eliminate any opening.
 3. Do not overlap the adjoining length of tape or rubber shim as this will prevent full contact around the perimeter of glass.
- L. Off-Set Glazing
 1. Where the glazing legs are off-set, the difference in the rabbet width shall be compensated by employing different glazing tapes with different diameter shims. The difference in shim shall be equal to the size of the off-set. The thinner tape shall be positioned first on the glazing leg closest to the interior. The thicker tape shall be cut to the exact length of the dimension between the applied tapes, and installed on the outermost glazing leg.
 2. Immediately prior to setting glass, paper backing shall be removed. Apply a toe bead of sealant 6" in each direction, from each corner.
 3. Locate setting blocks in the sill member at quarter points, or if necessary to within 6" of each corner. Setting blocks must be set equal distance from center line of the glass and high enough to provide the recommended bite and edge clearances.
 4. Set edge block according to glass manufacturer's recommendations.
 5. Set Glass: The glass shall be pressed firmly against the tape to achieve full contact.
 6. In a vented system, apply a heel bead (air seal) of sealant around the perimeter of glass, between the sole of the I.G. unit and the base of the rabbet of the metal framing developing a positive bond to the unit and to the metal framing. The bead of the sealant shall be deep enough so that it will partially fill the channel to a depth of 1/4" between the glass edge and the base of the metal framing rabbet.



7. Interior stops shall be set, and glazing tape spline for the appropriate face clearance shall be rolled into place, compressing the glass to the shim within the glazing tape.

3.6 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. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and 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. Do not remove release paper from tape until just before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant as recommended by glass manufacturer or glass frame manufacturer.
- G. 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.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape where noted on approved shop drawings.

3.7 GASKET GLAZING (DRY)

- A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance 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. 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. Install gaskets so they protrude past face of glazing stops.

3.8 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. 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.



1. Exterior glazing gasket shall be set a minimum of 1/8" below exterior glazing stop to create a channel for sealant installation.
- 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.

3.9 FRAMELESS MIRRORS

- A. Apply mastic to back of mirror "pats" spaced 4 pats/sq. ft.; adjust mirror so that it is plumb and in place to avoid distortion of reflecting images. Allow 1/8" space between back of mirror and wall surface.
 1. Apply "pats" using an electric applicator.
- B. Apply stainless steel clips at mirror top and bottom; securely clip to substrate using non-corrosive anchors. At drywall back-up anchors must be secured to studs or steel wallplate spanning from stud to stud.

3.10 PROTECTION AND CLEANING

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. 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 build-up of dirt, scum, alkaline deposits, or stains; remove as recommended by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents, and vandalism, during construction period.
- E. Clean excess sealant or compound from glass and framing members immediately after application, using solvents or cleaners recommended by manufacturers.
- F. Glass to be cleaned according to:
 1. GANA Glass Informational Bulletin GANA 01-0300 – "Proper Procedure for Cleaning Architectural Glass Products."
 2. GANA Glass Informational Bulletin GANA TD-02-0402 – "Heat Treated Glass Surfaces are Different."
- G. Do not use razor blades, scrapers or metal tools to clean glass.

END OF SECTION 08 80 00



SECTION 08 90 00 - LOUVERS AND 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. Operable formed-metal louvers.
 - 2. Fixed metal louvers.
 - 3. Blank-off panels.
 - 4. Bird screens.
- B. Related Sections
 - 1. Section 07 92 00 "Joint Sealants"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: Submit manufacturer's specifications, certified test data, where applicable, and installation instructions for required products, including finishes.
- C. Shop Drawings: Submit shop drawings for fabrication and erection of louver units and accessories. Include plans, elevations and details of sections and connections to adjoining work. Indicate materials, finishes, fasteners, joinery and other information to determine compliance with specified requirements.
- D. Samples: Submit six (6) inch square samples of each required finish. Prepare samples on metal of same gauge and alloy to be used in work. Where normal color and texture variations are to be expected, include two (2) or more units in each sample showing limits of such variations.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Structural Performance: Provide exterior metal louvers capable of withstanding the effects of loads and stresses from wind and snow and normal thermal movement without evidencing permanent deformation of louver components including blades, frames, and supports; noise or metal fatigue caused by louver blade rattle or flutter or permanent damage to fasteners and anchors.



1. Wind Load: Uniform pressure (velocity pressure) of not less than 30 lbf/sq. ft., acting inward or outward or greater if required by New York City Building Code.
- C. Thermal Movements: Provide louvers 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, and other detrimental effects.
 1. Temperature Change (Range): 120 deg. F., ambient; 180 deg. F, material surfaces.
- D. Comply with SMACNA "Architectural Sheet Metal Manual" recommendations for fabrication, construction details and installation procedures, except as otherwise indicated.
- E. Field Measurements: Verify size, location and placement of louver units prior to fabrication.
- F. Shop Assembly: Coordinate field measurements and shop drawings with fabrication and shop assembly to minimize field adjustments, splicing, mechanical joints and field assembly of units. Preassemble units in shop to greatest extent possible and disassemble as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

1.5 WARRANTY

- A. Finish shall be warranted for a period of 20 years, starting from date of Substantial Completion of the Project.

PART 2 PRODUCTS

2.1 OPERABLE FORMED-METAL LOUVERS

- A. Louvers shall incorporate adjustable blades in a single frame. Louvers shall be 6" deep and assembled entirely from extruded aluminum components. Blades and frames shall be 0.081" extruded aluminum, alloy 6063-T5. The adjustable blades, louver head and each jamb frame shall incorporate integral gutters to minimize water penetration. When open, adjustable blades shall be positioned at 45-degrees and spaced 6 1/2" on center. Adjustable blades may be fitted with dual-durometer vinyl blade-edge gaskets and stainless steel jamb seals to resist air leakage and water penetration when the adjustable blades are closed. The blade linkage assembly shall be fully-enclosed within the louver jamb frame and isolated from the active airstream.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide Airolite Company, LLC (The); Model T6786 or comparable product by one of the following:
 1. Greenheck Fan Corporation
 2. Ruskin Company
 3. Or approved equal.



2.2 FIXED LOUVERS

- A. Louvers shall be fixed blades with visible vertical mullions in a single frame. Louvers shall be 2" deep and assembled entirely from extruded aluminum components. Blades and frames shall be 0.063" extruded aluminum, alloy 6063-T5. Blades shall be stationary, horizontal and spaced 3" on center.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide Airlite Company, LLC (The); Model T6482 or comparable product by one of the following:
 - 1. Greenheck Fan Corporation
 - 2. Ruskin Company
 - 3. Or approved equal.

2.3 ALUMINUM FINISHES

- A. High-Performance Organic Finish, Two-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat.
 - 1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 2. Color and Gloss: Match dark color of existing mullions.

2.4 ACCESSORIES

- A. Bird Screens: Provide louvers with manufacturer's standard bird screen in removable aluminum frame. Finish to match louvers.
- B. Blank Offs: Provide aluminum blank-off panels behind louvers where shown on mechanical drawings, fabricated from 1/8" thick aluminum face sheets, finish to match louvers; reinforce as required to form rigid assembly. Blank-off panels shall be insulated with mineral fiber insulation of thickness needed to ensure an R value of eleven (11).
- C. Fastenings: Fasteners for exterior application shall be stainless steel. Provide types, gauges and lengths to suit unit installation conditions. Use Phillips flat head machine screws for exposed fasteners, unless otherwise indicated.
- D. Anchors and Inserts: Use non-ferrous metal or hot dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use steel or lead expansion bolt devices for drilled in place anchors. Furnish inserts, as required, to be set into concrete or masonry work.
- E. Bituminous Paint: SSPC-Paint 12 (cold applied asphalt mastic).

2.5 FABRICATION, GENERAL

- A. Fabricate frames including integral sills to suit adjacent construction with tolerances for installation, including application of sealants in joints between louvers and adjoining work.
- B. Include supports, anchorages, and accessories required for complete assembly.



- C. Provide sill extensions made of same material as louvers, where indicated, or required for drainage to exterior and to prevent water penetrating to interior.
- D. Join frame members to one another and to stationary louver blades by welding, except where indicated otherwise or where field bolted connections between frame members are necessary by size of louvers. Maintain equal blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions and directions for the installation of anchorages which are to be embedded in masonry construction. Coordinate the delivery of such items to the project site.

3.3 INSTALLATION

- A. Locate and place louver units plumb, level and in proper alignment with adjacent work.
- B. Install bird screens at openings in louvers.
- C. Use concealed anchorages wherever possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- D. Form tight joints with exposed connections accurately fitted together. Provide reveals and openings for sealants and joint fillers, as indicated.
- E. Restore finishes damaged by cutting, welding, soldering and grinding operations required for fitting and jointing. Restore finishes and prime coats of paint so that there is no evidence of corrective work. Return items which cannot be refinished in the field to the shop, make the required alterations, and refinish the entire unit, or provide new units, at Contractor's option.
- F. Protect aluminum surfaces from corrosion by application of a heavy coating of bituminous paint on surfaces which will be in contact with concrete, masonry or dissimilar metals.
- G. Provide concealed gaskets, flashings, joint fillers and insulations, and install as the work progresses to make the installations weathertight.

END OF SECTION 08 90 00



SECTION 09 21 16 - GYPSUM BOARD 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 work for partitions, ceilings, column enclosures, furring, and elsewhere where gypsum drywall work is shown on drawings.
2. Metal supports for gypsum drywall construction.
3. Acoustical insulation for gypsum drywall work.
4. Sealant for gypsum drywall work.
5. Concealed metal reinforcing for attachment of railings, toilet partitions and other items supported on drywall partitions and walls.
6. Taping and finishing of drywall joints.
7. Installing rings and frames in drywall surfaces for grilles, registers and lighting fixtures.
8. Gypsum shaftwall construction.
9. Bracing and connections.
10. Corner guards.

B. Related Sections

1. Section 07 21 00 "Thermal Insulation"
2. Section 08 11 13 "Hollow Metal Doors and Frames"
3. Section 08 31 13 "Access Doors and Frames"
4. Section 09 90 00 "Painting and Coating"
5. Section 23 37 13 "Diffusers, Registers and Grilles"
6. Section 26 50 00 "Lighting"



1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Submit shop drawing for each drywall partition, furring and ceiling system showing size and gauges of framing members, hanger and anchorage devices, wallboard types, insulation, sealant, methods of assembly and fastening, control joints indicating column lines, corner details, joint finishing and relationship of drywall work to adjacent work.
- C. Samples: Each material specified herein, 12" x 12", or 12" long, or in manufacturer's container, as applicable for type of material submitted.
- D. Manufacturer's Literature: Submit technical and installation instructions for each drywall partition, furring and ceiling system specified herein, and for each fire-rated and sound-rated gypsum board assembly. Submit other data as required to show compliance with these specifications, including data for mold resistant joint compound.
- E. Test Reports: This Contractor shall submit test report, obtained by drywall manufacturer, indicating conformance of drywall assemblies to required fire ratings and sound ratings.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. The following standards, as well as other standards which may be referred to in this Section, shall apply to the work of this Section:
 - 1. The Gypsum Construction Handbook, latest edition, USG.
 - 2. Construction Guide, latest edition, National Gypsum.
 - 3. ASTM A 568 "Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements For"
 - 4. ASTM C 475 "Standard Specification for Joint Treatment Materials For Gypsum Wallboard Construction"
 - 5. ASTM C 645 "Standard Specification for Non-Structural Steel Framing Members"
 - 6. ASTM C 754 "Standard Specification for Installation of Steel Framing Members to Receive Screw Attached Gypsum Panel Products"
 - 7. ASTM C 840 "Standard Specification for Application and Finishing of Gypsum Board"
 - 8. ASTM C 919 "Standard Specification for Use of Sealants in Acoustical Applications"
 - 9. ASTM C 954 "Standard Specification for Steel Drill Screws For the Application of Gypsum Board or Metal Plaster Bases to Steel Studs From 0.033 in. to 0.112 in. in Thickness"
 - 10. ASTM C 1002 "Standard Specification for Steel Self-Piercing Tapping Screws For the Application of Gypsum Board"



11. ASTM C 1177 "Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing"
 12. ASTM C 1178 "Standard Specification for Glass Mat Water Resistant Gypsum Backing Board"
 13. ASTM C 1278 "Standard Specification for Fiber-Reinforced Gypsum Panel"
 14. ASTM C 1396 "Standard Specification for Gypsum Board"
 15. ASTM D 3273 "Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber"
- C. Allowable Tolerances: 1/32" offsets between planes of board faces, and 1/16" in 8'-0" for plumb, level, warp and bow.
- D. System Design Load
1. Provide standard drywall wall assemblies designed and tested by manufacturer to withstand a lateral load of 5 lbs. per sq. ft. for the maximum wall height required, and with deflection limited to L/240 of partition height.
 - a. Drywall assemblies with tile finish shall have a deflection limit of L/360.
 2. Provide drywall ceiling assemblies designed, fabricated and installed to have a deflection not to exceed L/360.
- E. Fire-Resistance Rating: Where gypsum drywall with fire resistance ratings are indicated, provide materials and installations which are identical with those of applicable assemblies tested per ASTM E 119 by fire testing laboratories, or to design designations in UL "Fire Resistance Directory" or in listing of other testing agencies acceptable to the Commissioner, and compliant with UL Test #2079; criteria for cycle movement for all field height wall sections requiring allowance for vertical deflection within framing details.
- F. Installer: Firm with not less than 3 years of successful experience in the installation of specified materials.

1.5 PRODUCT HANDLING AND PROTECTION

- A. Deliver, store and handle drywall work materials to prevent damage. Deliver materials in their original, unopened containers or bundles, and store where protected from moisture, damage and from exposure to the elements. Store wallboard in flat stacks.
- B. Protect wallboard from becoming wet.

1.6 ENVIRONMENTAL CONDITIONS

- A. Provide and maintain minimum temperature of fifty-five (55) degrees F. and adequate ventilation to eliminate excessive moisture within the building in the area of the drywall work for at least twenty-four (24) hours, prior to, during and after installation of drywall work. Installation shall not start until windows are glazed and doors are installed, unless openings are temporarily closed. Space above suspended ceilings shall be vented sufficiently to prevent temperature and pressure build up.



1.7 JOB MOCK-UP

- A. At a suitable location, where directed by the Commissioner, lay up a portion of a finished wall and ceiling demonstrating the quality of work, including finishing, to be obtained under this Section. Omit drywall boards in locations as directed by the Commissioner to show stud spacing and attachments; after acceptance, complete assembly.
- B. Adjust the finishing techniques as required to achieve the finish required by the Commissioner as described in this Section of these specifications.
- C. Upon approval of the mock-up, the mock-up may be left in place as a portion of the finished work of this Section.
- D. All drywall work shall be equal in quality to approved mock-up.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers for Gypsum Drywall Panels and Accessories: Subject to compliance with requirements, provide products by one of the following:
 - 1. U.S. Gypsum Co.
 - 2. Georgia Pacific
 - 3. CertainTeed Corporation
 - 4. Continental
 - 5. National Gypsum Co.
 - 6. Or approved equal.
- B. Manufacturers for Metal Supports of Drywall Assemblies: Subject to compliance with requirements, provide products by one of the following unless otherwise noted:
 - 1. ClarkDietrich Building Systems
 - 2. Super Stud Building Products
 - 3. Marino/Ware
 - 4. Or approved equal.

2.2 METAL SUPPORTS

- A. Metal Floor and Ceiling Runners
 - 1. Channel Type: Formed from 20 U.S. Std. gauge (unless otherwise noted) galvanized steel, width to suit channel type metal studs. Use 20 ga. top runners with 1-1/4" minimum flanges.



2. Ceiling runners and head of wall connections at rated partitions shall conform to UL #2079 for cycle movement. Provide positive mechanical connection of framing to structure, allowing for vertical movement within connections. Minimum of 20 ga. galvanized steel for clips, 25 ga. galvanized steel for ceiling runners. Providing a friction free – anti-seizure movement capacity.
 - a. Basis of Design Product: Subject to compliance with requirements, provide Steel Network; VertiClip or VertiTrack or comparable product by one of the following:
 - 1). Metal-Lite Inc.
 - 2). Fire Trak Corporation
 - 3). Or approved equal.
 - b. Basis of Design Product: Subject to compliance with requirements, provide Fire Trak Corporation; FireTrak (including stud clips) or comparable product by one of the following:
 - 1). Metal-Lite Inc.
 - 2). ClarkDietrich Building Systems
 - 3). Or approved equal.
3. "J" Type: Formed from 20 U.S. Std. gauge galvanized steel, 1" x 2-1/2" or 4" wide (to suit detail) x 2-1/4" (for shaft wall).

B. Vertical Movement Clips

1. Basis of Design Product: Subject to compliance with requirements, provide ClarkDietrich Building Systems; Fastclip Side Clips (FCSC) or comparable product by one of the following:
 - a. Super Stud Building Products
 - b. Marino/Ware
 - c. Or approved equal.

C. Metal Studs, Framing and Furring

1. Channel Type Studs: Channel type with holes for passage of conduit formed from minimum 20 U.S. Std. gauge (unless heavier gauge is required to meet deflection limits) galvanized steel, width as shown on drawings.
2. Furring Channels: Hat shaped, formed from galvanized steel, 25 U.S. Std. gauge.
3. "C-H," "CT," or "I" Type Stud: 1-1/2" x 2-1/2", 4" or 6" wide (to suit detail) galvanized steel. Use for shaft wall construction; gauge and size as required to meet deflection limits given herein.
4. Double "E" Type Stud or "J" Track with Holding Tabs: 1" x 2-1/2", 4" or 6" wide (to suit detail) galvanized steel. Use for shaft wall construction; gauge and size as required to meet deflection limits given herein.
5. Continuous 16 gauge x 8" wide steel wall plate screwed to studs as required for support of railings, toilet partitions and other items supported on drywall partitions and walls.

D. Suspended Ceiling and Fascia Supports

1. Main Runners: 1-1/2" steel channels, cold rolled at 0.475 lbs. per ft., rust-inhibitive paint finish.



2. Furring Members: Screw-type hat-shaped furring channels of 25 ga. zinc-coated steel; comply with ASTM C 645.
3. Hangers: Galvanized, 1" x 3/16" flat steel slats capable of supporting 5x calculated load supported.
4. Hanger Anchorages: Provide inserts, clips, bolts, screws and other devices applicable to the required method of structural anchorage for ceiling hangers. Size devices for 5x calculated load supported.
5. Furring Anchorages: 16 ga. galvanized wire ties, manufacturer's standard clips, bolts or screws as recommended by furring manufacturer.

E. All galvanized steel members shall have coating conforming to ASTM A 653, G60.

2.3 GYPSUM WALLBOARD TYPES

- A. Gypsum Wall Board: 5/8" thick unless otherwise noted, 48" wide, in maximum lengths available to minimize end-to-end butt joints.
 1. Product: Subject to compliance with requirements, provide one of the following:
 - a. USG; Sheetrock
 - b. National Gypsum; Gold Bond
 - c. CertainTeed Corp.; Regular Gypsum
 - d. Or approved equal.
- B. Fire Rated Gypsum Wall Board: 5/8" thick unless otherwise noted, 48" wide, in maximum lengths available to minimize end-to-end butt joints.
 1. Product: Subject to compliance with requirements, provide one of the following:
 - a. USG; Sheetrock Firecode C
 - b. Lafarge/Continental; Firecheck Type C
 - c. National Gypsum; Gold Bond Fireshield
 - d. Or approved equal.
- C. Water Resistant Backing Board for Tile Finish: 5/8" thick unless otherwise noted. Cover joints with a pressure sensitive woven glass fiber tape.
 1. Product: Subject to compliance with requirements, provide one of the following:
 - a. USG; Fiberock Aqua-Tough
 - b. Georgia Pacific; Dens-Shield Tile Backer Board
 - c. CertainTeed Corp.; DiamondBack Tile Backer
 - d. Or approved equal.
- D. Moisture/Mold Resistant Gypsum Wall Board at locations listed below, unless otherwise shown on drawings: 5/8" thick unless otherwise noted, 48" wide, in maximum lengths available to minimize end-to-end butt joints. Board must have a rating of 10 per ASTM D 3273 with a core that meets ASTM C 1396, Section 6 or ASTM C 1658.



1. Areas in toilet rooms, lockers, janitor's closets not scheduled to receive ceramic tile, or where fire rating is required.
 2. Interior faces of exterior walls of basements, cellars and other below grade rooms.
 3. Walls and ceilings of spaces containing condensers, water tanks, water pumps and pressure reduction valves.
 4. Walls and ceilings of laundry rooms.
 5. Portions of walls within 2 feet of kitchen sinks to a height of 4 feet above the floor.
 6. Portions of walls within 2 feet of kitchen stoves to a height of 4 feet above the floor.
 7. Walls of bathrooms that are not solely water closet compartments, other than walls where cement board is specifically required.
 8. Walls and ceilings in service sink closets.
 9. Portion of walls within 2 feet of mop sinks or service sinks to a height of 4 feet above the floor.
 10. All perimeter walls and wet shafts.
 11. Product: Subject to compliance with requirements, provide one of the following:
 - a. USG; Mold Tough or Mold Tough FR
 - b. Georgia Pacific; DensArmor Plus
 - c. Lafarge/Continental; Mold Defense and/or Mold Defense Type X
 - d. National Gypsum; Gold Bond EXP Interior Extreme Gypsum Board
 - e. Or approved equal.
- E. Mold Resistant Shaft Wall Liner: Solid gypsum board liner for shaft wall construction, 1" thick, 24" wide, as required to suit condition, by standard lengths as required, beveled edges.
1. Liner board must have a rating 10 per ASTM D 3273 with a core that meets ASTM C 1396 Section 6.
 2. Product: Subject to compliance with requirements, provide one of the following:
 - a. USG; Mold Tough Liner Panel
 - b. Georgia Pacific; DensGlass Ultra Shaft Guard
 - c. Lafarge/Continental; Mold Defense Shaftliner Type X and/or Weather Defense Shaftliner Type X
 - d. National Gypsum; Gold Bond Brand Fireshield Shaft Liner XP, Gold Bond Brand EXP Extended Exposure Shaft Liner
 - e. CertainTeed Corp.; M2Tech Shaftliner
 - f. Or approved equal.

2.4 ACCESSORIES

- A. Acoustical Insulation: Paper-less, non-combustible, semi-rigid mineral fiber, 2" thick, in walls (unless otherwise indicated), 3 lb./cu. ft. maximum density



1. Product: Subject to compliance with requirements, provide one of the following:
 - a. Thermafiber LLC; Thermafiber
 - b. Roxul; Comfortbatt
 - c. Owens Corning; Sound Attenuation Fire Batt Insulation/MW
 - d. Or approved equal.
- B. Fasteners for Wall Board: USG Brand Screws, Tapcon, Ramset or approved equal; Type S Bugle Head for fastening wallboard to lighter gauge interior metal framing (up to 20 ga.). Type S-12 Bugle Head for fastening wallboard to heavier gauge interior metal framing (20 ga. to 12 ga.); Type S and Type S-12 Pan Head for attaching metal studs to door frames and runners; and Type G Bugle Head for fastening wallboard to wall board. Lengths specified below under "Part 3 - Execution" Articles and as recommended by drywall manufacturer.
- C. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
- D. Metal Trim - Corner Beads: For 90 degree External Corners - 27 U.S. Std. ga. galvanized steel, 1-1/4" x 1-1/4", for 90 degree external corners; ASTM C 1047.
- E. Metal Trim - Edge Beads: Paper-faced galvanized-steel sheet; ASTM C 1047.
- F. Metal Trim - Reveal Trim
 1. Single Leg Reveal
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Fry Reglet Corporation; "Z" Reveal or comparable product by one of the following:
 - 1). Gordon, Inc.
 - 2). Pittcon Industries
 - 3). Or approved equal.
 2. Drywall Reveal Molding
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Fry Reglet Corporation; Drywall Reveal Molding or comparable product by one of the following:
 - 1). Gordon, Inc.
 - 2). Pittcon Industries
 - 3). Or approved equal.
- G. Metal Trim Treatment Materials and Joint Treatment Materials for Gypsum Drywall Boards: Paper tape for joint reinforcing; setting type or lightweight setting type joint compound for taping and topping; and ready-mix compound for finishing.
 1. For mold-resistant drywall, water resistant drywall, and tile backer board, use glass mesh tape with setting joint compound that is rated 10 when tested in accordance with ASTM D 3273 and evaluated in accordance with ASTM D 3274.
 2. Joint Compound



- a. Product: Subject to compliance with requirements, provide one of the following:
 - 1). CTS Cement Manufacturing Corp.; Rapid Set One Pass
 - 2). Lafarge North America; Rapid Joint
 - 3). CertainTeed; M2Tech 90
 - 4). Or approved equal.

H. Control Joints

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide USG; No. 0.093 or comparable product by one of the following:
 - a. Lafarge
 - b. National Gypsum
 - c. Or approved equal.

I. Acoustical Sealant

- 1. Product: Subject to compliance with requirements, provide one of the following:
 - a. USG; Sheetrock Brand Acoustical Sealant
 - b. Tremco Mfg. Co.; Tremco Acoustical Caulking
 - c. Pecora; AIS-919
 - d. Or approved equal.

J. Neoprene Gaskets: Conform to ASTM D 1056.

K. Metal Integrated Corner Guards

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide Pittcon; Softforms, model as selected by the Commissioner, or comparable product by one of the following:
 - a. Brown Manufacturing Co.
 - b. Construction Specialties, Inc.
 - c. Or approved equal.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. General

- 1. Install drywall work in accordance with drywall manufacturer's printed instructions and as indicated on drawings and specified herein.
- 2. All metal framing for drywall partitions shall extend from floor to underside of structural deck above. Provide for vertical deflection with positive mechanical connections of framing members to structure.



3. Provide concealed reinforcement, 16 ga. thick by eight (8) inches wide or as detailed or as recommended by manufacturer, for attachment of railings, toilet partitions, and other items to be supported on the partitions which cannot be attached to the metal framing members. Concealed reinforcement shall span between metal studs and be attached thereto using two (2) self-tapping pan head screws at each stud.
 - a. Back of drywall shall be scored or notched to prevent bulging out where reinforcement plate occurs.
- B. Fire-Rated Assemblies: Install fire-rated assemblies in accordance with requirements of the New York City Building Code, Underwriters' Laboratories and test results obtained and published by the drywall manufacturer, for the fire-rated drywall assembly types indicated on the drawings.
- C. Acoustical Assemblies: Install acoustically-rated assemblies to achieve a minimum STC as noted on drawings, in accordance with test results obtained and published by the drywall manufacturer, for the drywall assembly type indicated on the drawings.
- D. Sealant
 1. Install continuous acoustical sealant bead at top and bottom edges of wallboard where indicated or required for sound rating as wallboard is installed, and between metal trim edge beads and abutting construction.
 2. Install acoustical sealant in 1/8" wide vertical control joints within the length of the wall or partitions, and in all other joints, specified below under "Control Joints." Install bead of acoustical sealant around electric switch and outlet boxes, piping, ducts, and around any other penetration in the wallboard; place sealant bead between penetrations and edge of wallboard.
 3. Where sealant is exposed to view, protect adjacent surfaces from damage and from sealant material, and tool sealant flush with and in same plane as wallboard surface. Sealant beads shall be 1/4" to 3/8" diameter.
- E. Wall Board Application
 1. Do not install wallboard panels until steel door frames are in place; coordinate work with Section 08 11 13, Hollow Metal Doors and Frames.
 2. See drawings for all board types. Use fire-rated wallboard for fire-rated assemblies. Use sag-resistant board for ceilings. Use water-resistant wallboard where indicated on drawings and where wallboard would be subject to moisture. Install water-resistant wallboard in full, large sheets (no scraps) to limit number of butt joints.
 3. Apply wallboard with long dimension parallel to stud framing members, and with abutting edges occurring over stud flanges.
 4. Install wallboard for partitions from floor to underside of structure above and secure rigidly in place by screw attachment, unless otherwise indicated.
 5. Provide safing insulation meeting standards of Section 07 84 00, Firestopping, at flutes of metal deck where partitions carry up to bottom of metal deck.



6. Neatly cut wallboard to fit around outlets, switch boxes, framed openings, piping, ducts, and other items which penetrate wallboard; fill gaps with acoustic sealant.
 7. Where wallboard is to be applied to curved surfaces, dampen wallboard on back side as required to obtain required curve. Finish surface shall present smooth, even curve without fluting or other imperfections.
 8. Screw fasten wallboard with power-driven electric screw driver, screw heads to slightly depress surface of wallboard without cutting paper, screws not closer than 3/8" from ends and edges of wallboard.
 9. Where studs are doubled-up, screw fasten wallboard to both studs in a staggered pattern.
- F. Cementitious Backer Board
1. General: Furnish cementitious backer board in maximum available lengths. Install horizontally, with end joints over framing members.
 2. Fastening: Secure cementitious backer board to each framing member with screws spaced not more than 12 inches on center and not closer than 1/2" from the edge. Install screws with a conventional screw gun so that the screw heads are flush with the surface of the board.
 3. Joint Treatment: Fill space between edge of backer and receptor with dry-set Portland cement or latex-Portland cement mortar. Fill all horizontal and vertical joints and corners with dry-set Portland cement or latex-Portland cement mortar. Apply fiberglass tape over joints and corners and embed with same mortar.
- G. Metal Trim: Install and mechanically secure in accordance with manufacturer's instructions; and finish with three (3) coats of joint compound, feathered and finish sanded smooth with adjacent wallboard surface, in accordance with manufacturer's instructions.
1. Corner Beads: Install specified corner beads in single lengths at all external corners, unless corner lengths exceed standard stock lengths.
 2. Edge Beads: Install specified edge beads in single lengths at all terminating edges of wallboard exposed to view, where edges abut dissimilar materials, where edges would be exposed to view, and elsewhere where shown on drawings. Where indicated on drawings, seal joint between metal edge bead and adjoining surface with specified gasket, 1/8" wide minimum and set back 1/8" from face of wallboard, unless other size and profile indicated on drawings.
 3. Casing beads shall be set in long lengths, neatly butted at joints. Provide casing beads at juncture of board and vertical surfaces and at exposed perimeters.
- H. Control Joint Locations: Gypsum board surfaces shall be isolated with control joints where:
1. Ceiling abuts a structural element, dissimilar wall or other vertical penetration.
 2. Construction changes within the plane of the partition or ceiling.
 3. Shown on approved shop drawings.
 4. Ceiling dimensions exceed thirty (30) feet in either direction.



5. Wings of "L," "U," and "T" shaped ceiling areas are joined.
6. Expansion or control joints occur in the structural elements of the building.
7. Shaftwall runs exceed 30' without interruption.
8. Partition or furring abuts a structural element or dissimilar wall or ceiling.
9. Partition or furring runs exceed 30' without interruption.
10. Where control joints are required, ceiling height door frames may be used as control joints. Less than ceiling height frames shall have control joints extending to the ceiling from both corners.

I. Joint Treatment and Spackling

1. Joints between face wallboards in the same plane, joints at internal corners of intersecting partitions and joints at internal corners of intersections between ceilings and walls or partitions shall be filled with joint compound.
2. Screw heads and other depressions shall be filled with joint compound. Joint compound shall be applied in three (3) coats, feathered and finish surface sanded smooth with adjacent wallboard surface, in accordance with manufacturer's instructions. Treatment of joints and screw heads with joint compound is also required where wallboard will be covered by finish materials which require a smooth surface, such as vinyl wall coverings.

3.3 FURRED WALLS AND PARTITIONS

- A. Use specified metal furring channels. Run metal furring channel framing members vertically, space sixteen (16) inches o.c. maximum. Fasten furring channels to concrete or masonry surfaces with power-driven fasteners or concrete stub nails spaced sixteen (16) inches o.c. maximum through alternate wing flanges (staggered) of furring channel. Furring channels shall be shimmed as necessary to provide a plumb and level backing for wallboard. At inside of exterior walls, an asphalt felt protection strip shall be installed between each furring channel and the wall. Furring channel and splices shall be provided by nesting channels at least eight (8) inches and securely anchoring to concrete or masonry with two (2) fasteners in each wing.
- B. Wallboard Installation: Same as specified under Article 3.4 - "Metal Stud Partitions."

3.4 METAL STUD PARTITIONS

- A. Unless otherwise noted, steel framing members shall be installed in accordance with ASTM C 754.
- B. Runner Installation: Use channel type. Align accurately at floor according to partition layout. Anchor runners securely sixteen (16) inches o.c. maximum with power-driven anchors to floor slab, with power-driven anchors to structural slab above. See "Stud Installation" below for runners over heads of metal door frames. Where required, carefully remove sprayed-on fireproofing to allow partition to be properly installed.



C. Stud Installation

1. Use channel type, positioned vertically in runners, spaced as noted on drawings, but not more than sixteen (16) inches o.c.
2. Anchor studs to floor runners with screw fasteners. Provide snap-in or slotted hole slip joint bolt connections of studs to ceiling runners leaving space for movement. Anchor studs at partition intersections, partition corners and where partition abuts other construction to floor and ceiling runners with sheet metal screws through each stud flange and runner flange.
3. Connection at ceiling runner for non-rated partitions shall be snap-in or slotted hole slip joint bolt connection that shall allow for movement. Seal studs abutting other construction with 1/8" thick neoprene gasket continuously between stud and abutting construction.
4. Connections for fire rated partitions at ceiling runners shall conform to UL Design #2079.
5. Install metal stud horizontal bracing wherever vertical studs are cut or wallboard is cut for passage of pipes, ducts or other penetrations, and anchor horizontal bracing to vertical studs with sheet metal screws.
6. At jambs of door frames and borrowed light frames, install doubled-up studs (not back to back) from floor to underside of structural deck, and securely anchor studs to jamb anchors of frames and to runners with screws. Provide cross braces from hollow metal frames to underside of slab.
7. Over heads of door frames, install cut-to-length section of runner with flanges slit and web bent to allow flanges to overlap adjacent vertical studs, and securely anchor runner to adjacent vertical studs with sheet metal screws. Install cut-to-length vertical studs from runner (over heads of door frame) to ceiling runner sixteen (16) inches maximum o.c. and at vertical joints of wallboard, and securely anchor studs to runners with sheet metal screws.
8. At control joints, in field of partition, install double-up studs (back to back) from floor to ceiling runner, with 1/4" thick continuous compressible gasket between studs. When necessary, splice studs with eight (8) inches minimum nested laps and attach flanges together with two (2) sheet metal screws in each flange. All screws shall be self-tapping sheet metal screws.

- D. Runners and Studs at Chase Wall:** As specified above for "Runners" and "Studs" and as specified herein. Chase walls shall have either a single or double row of floor and ceiling runners with metal studs sixteen (16) inches o.c. maximum and positioned vertically in the runners so that the studs are opposite each other in pairs with the flanges pointing in the same direction. Anchor all studs to runner flanges with sheet metal screws through each stud flange and runner flange following requirements of paragraph 3.4, B. Provide cross bracing between the rows of studs by attaching runner channels or studs set full width of chase attached to vertical studs with one self-tapping screw at each end. Space cross bracing not over thirty-six (36) inches o.c. vertically.

E. Wallboard Installation - Single Layer Application (Screw Attached)

1. Install wallboard with long dimension parallel to framing member and with abutting edge joints over web of framing member. Install wallboard with long dimension perpendicular to framing members above and below openings in drywall extending to second stud at each side of opening. Joints on opposite sides of wall shall be arranged so as to occur on different studs.



2. Boards shall be fastened securely to metal studs with screws as specified. Where a free end occurs between studs, back blocking shall be required. Center abutting ends over studs. Correct work as necessary so that faces of boards are flush, smooth, true.
 3. Wallboard screws shall be applied with an electric screw gun. Screws shall be driven not less than 3/8" from ends or edges of board to provide uniform dimple not over 1/32" deep. Screws shall be spaced twelve (12) inches o.c. in the field of the board and 8" o.c. staggered along the abutting edges.
 4. All ends and edges of wallboard shall occur over screwing members (studs or furring channels). Boards shall be brought into contact but shall not be forced into place. Where ends or edges abut, they shall be staggered. Joints on opposite sides of a partition shall be so arranged as to occur on different studs.
 5. At locations where piping receptacles, conduit, switches, etc., penetrate drywall partitions, provide non-drying sealant and an approved sealant stop at cut board locations inside partition.
- F. Wallboard Installation - Double-Layer Application
1. General: See drawings for wallboard partition types required.
 2. First Layer (Screw Attached): Install as described above for single layer application.
 3. Second Layer (Screw Attached): Screw attach second layer, unless laminating method of attachment indicated on drawings or necessary to obtain required sound rating or fire rating. Install wallboard vertically with vertical joints offset thirty-two (32) inches from first layer joints and staggered on opposite sides of wall. Attach wallboard with 1-5/8" screws sixteen (16) inches o.c. along vertical joints and sixteen (16) inches o.c. in the field of the wallboard. Screw through first layer into metal framing members.
 4. Second Layer (Laminated): Install wallboard vertically. Stagger joints of second layer from first layer joints. Laminate second layer with specified laminating adhesive in beads or strips running continuously from floor to ceiling in accordance with manufacturer's instructions. After laminating, screw wallboard to framing members with 1-5/8" screws, spaced twelve (12) inches o.c. around perimeter of wallboard.
- G. Wallboard Installation - Laminated Application: Where laminated wallboard is indicated, use specified laminating adhesive, install wallboard vertically and maintain tolerances as specified for screw attached wallboard.
- H. Insulation Installation: Install where indicated on drawings. Place blanket tightly between studs.
- I. Deflection of Structure Above: To allow for possible deflection of structure above partitions, provide top runners for non-rated partitions with 1-1/4" minimum flanges and do not screw studs or drywall to top runner. Where positive anchorage of studs to top runner is required, anchorage device shall be by means of slotted hole (in clip connection with screw attachment to web of steel through bushings located in slots of clips), or other anchorage device approved by the Commissioner.
- J. Control Joints
1. Leave a 1/2" continuous opening between gypsum boards for insertion of surface mounted joint.



2. Back by double framing members.
3. Attach control joint to face layer with 9/16" galvanized staples six (6) inches o.c. at both flanges along entire length of joint.
4. Provide two (2) inch wide gypsum panel strip or other adequate seal behind control joint in fire rated partitions and partitions with safing insulation.

3.5 DRYWALL FASCIAS AND CEILINGS

- A. Furnish and install inserts, hanger clips and similar devices in coordination with other work.
- B. Secure hangers to inserts and clips. Clamp or bolt hangers to main runners.
- C. Space main runners 4'-0" o.c. and space hangers 4'-0" o.c. along runners, except as otherwise shown.
- D. Level main runners to a tolerance of 1/4" in 12'-0", measured both lengthwise on each runner and transversely between parallel runners.
- E. Metal Furring Channels: Space sixteen (16) inches o.c. maximum. Attach to 1-1/2" main runner channels with furring channel clips (on alternate sides of main runner channels). Furring channels shall not be let into or come in contact with abutting masonry walls. End splices shall be provided by nesting furring channels no less than eight (8) inches and securely wire tying. At any openings that interrupt the furring channels, install additional cross reinforcing to restore lateral stability.
- F. Mechanical accessories, hangers, splices, runner channels and other members used in suspension system shall be of metal, zinc coated, or coated with rust inhibitive paint, of suitable design and of adequate strength to support units securely without sagging, and such as to bring unit faces to finished indicated lines and levels.
 1. Provide special furring where ducts are over two (2) feet wide.
- G. Apply board with its long dimension at right angles to channels. Locate board butt joints over center of furring channels. Attach board with one (1) inch self-drilling drywall screws twelve (12) inches o.c. in field of board at each furring channel; eight (8) inches o.c. at butt joints located not less than 3/8" from edges.

3.6 SHAFT WALLS

- A. Runner Installation: Use "J" metal runners at floor and ceiling, with the short leg toward finish side of wall. Securely attach runners to structural supports with power-driven fasteners at both ends and twenty-four (24) inches o.c.
- B. Shaft Wall Liner: Cut shaft wall liner panels one (1) inch less from floor to ceiling height and erect vertically between J-runners.
- C. C-H Studs: Cut metal studs 3/8" to not more than 1/2" less than floor to ceiling height and install between shaft wall liner panels so that panels are fitted snugly into the one (1) inch wide "H," "T," or "I" portion of the stud. Space studs twenty-four (24) inches o.c., unless otherwise indicated on drawings. Install full length steel E-Studs or J-runners vertically at T-intersections, corners, door jambs, and columns. Install full length E-Studs or J-runners over shaft wall liner both sides of closure panels. Frame openings cut within a liner panel with J-runner around perimeter. For openings, frame with vertical E-Stud or J-runner at edges,



horizontal runner at head and sill, and reinforcing as shown on the drawings. Suitably frame all openings to maintain structural support for wall. Over metal doors, install a cut to length section of runner and attach to strut-studs with clip angles and 3/8" Type S Screws space twelve (12) inches o.c.

- D. Wallboard Installation - Double Layer Installation: Erect gypsum wallboard base layer vertically or horizontally to meet fire rating on one side of studs with end joints staggered. Fasten base layer panels to studs with one (1) inch Type S screws twenty-four (24) inches o.c. Caulk perimeter of base layer panels. Apply gypsum wallboard face layer vertically over base layer with joints staggered and attached with 1-5/8" Type S screws staggered from those in base, spaced eight (8) inches o.c. and driven into studs.
- E. Wallboard Installation (Where Both Sides of Shaft Wall are Finished): Apply gypsum wallboard face layers vertically both sides of studs. Stagger joints on opposite partition sides. Fasten panels with one (1) inch or two (2) inches Type S screws spaced eight (8) inches o.c. in field and along edges into studs.
- F. Where handrails are indicated for direct attachment to drywall shaft system, provide not less than a sixteen (16) ga. x eight (8) inches wide galvanized steel reinforcement strip, accurately positioned and secured to studs and concealed behind not less than one 1/2" thick course of gypsum board in the system.
- G. Integrate stair hanger rods with drywall shaft system by locating cavity of system as required to enclose rods.

3.7 ERECTION AT COLUMN ENCLOSURES

- A. Metal furring supports shall be provided under work of this Section, and shall be cut to lengths as necessary for tight fit such that spacing is not more than sixteen (16) inches o.c.
- B. Board shall be fastened securely to supports with screws as specified. Place boards in position with minimum amount of joints. Where free ends occur between supports, back-blocking or furring shall be required. Center abutting ends over supports. Correct work as necessary so that faces of boards are flush, smooth and true. Provide clips or cross furring for attachment as required.
- C. All layers shall be screw attached to furring.
- D. When column finish called for on drawings to be in the same plane as drywall finish layer, maintain even, level plane.

3.8 FINISHING

- A. Taping: A thin, uniform layer of compound shall be applied to all joints and angles to be reinforced. Reinforcing tape shall be applied immediately, centered over the joint, seated into the compound. A skim coat shall follow immediately, but shall not function as a fill or second coat. Tape shall be properly folded and embedded in all angles to provide a true angle.
- B. Filling: After initial coat of compound has hardened, additional compound shall be applied, filling the board taper flush with the surface. The fill coat shall cover the tape and feather out slightly beyond the tape. On joints with no taper, the fill coat shall cover the tape and feather out at least four (4) inches on either side of the tape. No fill coat is necessary on interior angles.
- C. After compound has hardened, a finishing coat of compound shall be spread evenly over and extending slightly beyond the fill coat on all joints and feathered to a smooth, uniform finish. Over tapered edges, the



finished joint shall not protrude beyond the plane of the surface. All taped angles shall receive a finish coat to cover the tape and taping compound, and provide a true angle. Where necessary, sanding shall be done between coats and following the final application of compound to provide a smooth surface, ready for painting.

- D. Fastener Depressions: Compound shall be applied to all fastener depressions followed, when hardened by at least two (2) coats of compound, leaving all depressions level with the plane of the surface.
- E. Finishing Beads and Trim: Compound shall be applied to all bead and trim and shall be feathered out from the ground to the plane of the surface. When hardened, this shall be followed by two (2) coats of compound each extending slightly beyond the previous coat. The finish coat shall be feathered from the ground to the plane of the surface and sanded as necessary to provide a flat, smooth surface ready for decoration.
- F. Except as otherwise noted, level of finish for surface exposed to view shall conform to Level 4 of ASTM C 840 and GA-214 of the Gypsum Association.
- G. Drywall construction with defects of such character which will mar appearance of finished work, or which is otherwise defective, will be rejected and shall be removed and replaced at no expense to the City of New York.

3.9 CLEANING AND ADJUSTMENT

- A. At the completion of installation of the work, all rubbish shall be removed from the building leaving floors broom clean. Excess material, scaffolding, tools and other equipment shall be removed from the building.
- B. Work shall be left in clean condition ready for painting or wall covering. All work shall be as approved by the Commissioner.
- C. Cutting and Repairing: Include all cutting, fitting and repairing of the work included herein in connection with all mechanical trades and all other trades which come in conjunction with any part of the work, and leave all work complete and perfect after all trades have completed their work.

3.10 PROTECTION OF WORK

- A. Installer shall advise Contractor of required procedures for protecting drywall work from damage and deterioration during remainder of construction period.

END OF SECTION 09 21 16



**Department of
Design and
Construction**

FMS No. - LNCA13HAM

Issue Date - 04/15/2022

THIS PAGE INTENTIONALLY LEFT BLANK



SECTION 09 30 13 - CERAMIC 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 floor, wall tile and base.
 - 2. Setting beds, grout, sealant and waterproofing membrane.
- B. Related Sections
 - 1. Section 04 20 00 "Unit Masonry"
 - 2. Section 09 21 16 "Gypsum Board Assemblies"

1.3 REFERENCES

- A. ANSI A108 Series/A118 Series - American National Standards for Installation of Ceramic Tile.
- B. ANSI A136.1 - American National Standards for Organic Adhesives for Installation of Ceramic Tile.
- C. ASTM C 144 - Standard Specification for Aggregate for Masonry Mortar.
- D. ASTM C 150 - Standard Specification for Portland Cement.
- E. TCNA - Handbook for Ceramic, Glass and Stone Tile Installation; Tile Council of North America.
- F. ISO 13007 - International Standards Organization; Classification for Grout and Adhesives.

1.4 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Samples
 - 1. Before any ceramic tile is delivered to the job site, submit to the Commissioner sample panels, approx. 12" x 12", mounted on hardboard back-up with selected grout color for each color and pattern of ceramic tile and grout specified.
 - 2. Submit 12" x 12" samples of waterproofing membrane.



- C. Master Grade Certificates: Prior to opening ceramic tile containers, submit to the Commissioner a Master Grade Certificate, signed by an officer of the firm manufacturing the ceramic tile used, and issued when the shipment is made, stating the grade, kind of tile, identification marks for tile containers, and the name and location of the project.
- D. Mock-Ups
 - 1. At an area on the site where approved by the Commissioner, provide a mock-up ceramic tile installation.
 - a. Make the mock-up approximately 36" x 36" in dimension.
 - b. Provide one mock-up for each type, class, and color of installation required under this Section.
 - c. The mock-ups may be used as part of the Work, and may be included in the finished Work when so approved by the Commissioner.
 - d. Revise as necessary to secure the Commissioner's approval.
 - 2. The mock-ups, when approved by the Commissioner, will be used as datum for comparison with the remainder of the work of this Section for the purposes of acceptance or rejection.
 - 3. If the mock-up panels are not permitted to be part of the finished Work, completely demolish and remove them from the job site upon completion and acceptance of the work of this Section.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Qualifications of Installers: For cutting, installing and grouting of ceramic tile, use only thoroughly instructed and experienced tile setters who are completely familiar with the requirements of this work, and the recommendations contained in the referenced standards.

1.6 PRODUCT HANDLING

- A. Delivery and Storage
 - 1. Deliver all materials of this Section to the job site in their original unopened containers with all labels intact and legible at time of use.
 - 2. Store all materials under cover in a manner to prevent damage and contamination; store only the specified materials at the job site.
- B. Protection: Use all means necessary to protect the materials of this Section before, during, and after installation, and to protect the installed work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.
- B. Vent temporary heaters to exterior to prevent damage to tile work from carbon dioxide buildup.



- C. Maintain temperatures at not less than 50 deg. F. in tiled areas during installation and for 7 days after completion.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Manufacture all ceramic tile in accordance with Standard Grade Requirements of ANSI A-137.1.
- B. Install all ceramic tile in accordance with the recommendations contained in "Tile Council of North America Handbook for Ceramic, Glass, and Stone Tile Installation (TCNA)," latest edition.

2.2 MANUFACTURERS OF TILE

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Nemo Tile; 4" x 4 unglazed ceramic mosaic tile Color #15, or comparable product by one of the following:
 - 1. American Olean
 - 2. Dal Tile
 - 3. Or approved equal.

2.3 TRIM AND SPECIAL SHAPES

- A. Provide external and internal corners, trim shapes at openings, and all other trim and special shapes to match the tile specified herein, as required by field conditions and drawing details.

2.4 SETTING BEDS AND GROUT

- A. Portland Cement: ASTM C 150, Type 1.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Sand: ASTM C 144, clean and graded natural sand.
- D. Latex Admixture for Mortar Bed
 - 1. MAPEI, Planicrete AC, blended with a 3:1 site mix.
 - 2. Laticrete 333.
 - 3. Pro Spec; Acrylic Additive.
 - 4. Custom Building Products; Custom Crete Thin Set Additive.
 - 5. Or approved equal.
- E. Latex-Portland Cement Bond Coat, complying with ANSI A118.4 and ISO 13007, C2ES2P2 with minimum compressive strength of 400 psi.



1. MAPEI, Keralastic System thin set mortar, consisting of Kerabond dry-set mortar and Keralastic latex admixture.
 2. Laticrete; 211 dry-set mortar and 4237 latex admixture.
 3. Pro Spec; Permalastic System consisting of Permalastic Dryset Mortar and Permalastic Admixture
 4. Custom Building Products; Pro-Lite.
 5. Or approved equal.
- F. Wall and Base Tile
1. Over drywall, use ANSI A136.1-1967 Organic Adhesive for installation of Ceramic Tile, Type I and ISO 13007 D2TE. Shear strength shall be 50 psi minimum. Adhesive primer as recommended by adhesive manufacturer. Manufacturer shall certify, in writing, that adhesive and primer used are proper types for the intended tile types and application. Conform to TCA Detail W-242.
 - a. MAPEI Type 1 Mastic.
 - b. Laticrete Type 1 Adhesive.
 - c. ProSpec B-1000 Tile Adhesive.
 - d. Custom Building Products' Reliabond Adhesive Type 1.
 - e. Or approved equal.
 2. Over masonry, use a mortar bed leveling coat conforming to ANSI A108.1A followed by a Latex Portland Cement Bond Coat, MAPEI, Kerabond/Keralastic System, Custom Mega Flex or equal by Laticrete, Pro Spec or approved equal, conforming to ANSI A118.4, ISO 13007-C2ES2P2, and TCA Detail W-211.
 3. Over cement board, use a Latex Portland cement mortar bond coat, MAPEI, Kerabond/Keralastic System, Custom Mega Flex or equal by Laticrete, Pro Spec or approved equal, conforming to ANSI A118.4, ISO 13007-C2ES2P2, and TCA Detail W-244; coat back of board with waterproof membrane as specified below.
 4. Over glass mat water resistant gypsum backer board, use a Latex Portland cement mortar bond coat, MAPEI, Kerabond/Keralastic System or equal by Laticrete, Pro Spec or approved equal, conforming to ANSI A118.4, ISO 13007-C2ES2P2, and TCA Detail W-245.
- G. Floor Tile: Comply with TCNA Detail F-144, thinset and waterproofing over CBU over plywood. CBU to be screwed down and joints to be finished per manufacturer requirements.
- H. Waterproofing Membrane: Complying with ANSI A118.10 and ANSI A118.12; and having IAPMO certification as a shower pan liner; provide "Mapelastic 400" by Mapei with factory blended "Bio-Block" antimicrobial protection, "Laticrete 9235 with Microban" made by Laticrete International," ProSpec "B6000," Custom Building Products' "9240," or approved equal.
1. Reinforce membrane with polyester fabric.
 2. Run waterproofing up full height of walls.
- I. Water: Clean, fresh and suitable for drinking.



- J. Grout complying with A118.7; and ISO 13007, CG2WAF
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Laticrete; Permacolor Select. Silver Grey #78 or comparable product by one of the following:
 - a. Mapei
 - b. Custom
 - c. Or approved equal.
- K. Physical Properties: The setting beds and grouts must meet the following physical requirements:
 - 1. Compressive Strength: 3000 psi min.
 - 2. Shear Bond Strength: 500 psi min.
 - 3. Water Absorption: 4.0% max.
 - 4. Service Rating (ASTM C 627): Extra Heavy Duty.
- L. Sealer: Seal all grout joints and all unglazed tile using sealer approved by manufacturer.
- M. Temporary Protective Coating: Either product indicated below that is applied in the tile manufacturer's factory and formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
 - 1. Petroleum paraffin wax, applied hot, fully refined and odorless, containing at least 0.5 percent oil with a melting point of 120 to 140 deg. F. per ASTM D 87.
 - 2. Grout release in form of manufacturer's standard liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.
- N. 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.

2.5 SEALANT

- A. Joint Backing: Preformed, compressible, resilient, non-extruding, non-staining strips of foam neoprene, foam polyethylene, or other material recommended by sealant manufacturer.
- B. Bond Breaker: Polyethylene tape, 3 mils thick, or other material recommended by sealant manufacturer.
- C. Sealant Primer: Colorless, non-staining, or type to suit substrate surface, as recommended by sealant manufacturer.
- D. Sealant: One-part silicone based sanitary sealant, conforming to ASTM C 920, Type S, Grade NS, Class 25. Sealant hardness upon full cure shall be between 20-30 Shore "A" Durometer. Color of sealant to blend with or match adjacent materials, and as selected by the Commissioner. Sealant shall be equivalent to 1700 Sanitary Sealant made by General Electric, Dupont, Sika or approved equal.



PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 CONDITION OF SURFACES

- A. Grind or fill masonry substrates as required to comply with allowable variations.

3.3 PREPARATION

- A. 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.
- B. Field Applied Temporary Protective Coating: Pre-coat tile with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.4 JOINTS IN TILE WORK

- A. Joint Widths: 1/16" wide in ceramic tile.
- B. Alignment: Wall, base and floor joints shall align through the field and trim. Direction and location of all joints as directed by Commissioner.
- C. Movement Joints: Conform to TCA Detail EJ171. Locate where movement joints are in back-up material. Provide movement joint at joints between mop receptors and ceramic tile. Provide movement joint at all vertical internal joints of wall tile. Movement joints 1/8" wide in ceramic tile. Fill all movement joints with specified backing and sealant. Use bond breaker where sufficient space for joint backing does not exist.
 - 1. Provide sealant between ceramic tile and plumbing fixtures, mirrors, pipes, countertops and other dissimilar materials penetrating or adjacent to ceramic tile.

3.5 INSTALLATION

- A. Comply with the following installation standards:
 - 1. Wall tile over drywall using organic adhesive - ANSI A136.1 and ISO 13007, D2TE.
 - 2. Wall tile over cement board or glass mat backer board using dry set mortar with latex additive - ANSI A118.4 and ISO 13007, C2ES2P2.
 - 3. Wall tile over masonry or concrete using dry set mortar with latex additive - ANSI A118.4 and ISO 13007, C2ES2P2.
 - 4. Floor tile: ANSI A118.1, ANSI A118.4.
- B. Backs of tile must be cleaned before installation.
- C. All setting beds and/or adhesives shall provide for an average contact area of not less than 95% coverage.



- D. Allowable Variations in Finished Work: Do not exceed the following deviations from level and plumb, and from elevations, locations, slopes and alignment shown.
 - 1. Walls: 1/8" in 8'-0" run, any direction; 1/8" at any location; offset at any location, 1/32".
 - 2. Joints: +/- 1/32" joint width variation of any location; 1/16" in 3'-0" run deviation from plumb and true.
- E. Waterproofing Membrane: Install the membrane in strict accordance with manufacturer's written recommendations.
- F. Handle, store, mix and apply setting and grouting materials in compliance with the manufacturer's instructions.
- G. Terminate work neatly at obstructions, edges and corners without disruption of pattern or joint alignment.
- H. 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 and fixtures so that plates, collars, or covers overlap tile.
- I. Lay tile in grid pattern. Align joints when adjoining tiles on floor, base, walls and trim are the same size. Lay out tile work and center tile fields both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths.

3.6 CLEANING AND PROTECTION OF CERAMIC TILE

- A. Cleaning: On completion of placement and grouting, clean all ceramic 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 cleaners 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 to ensure removal of all cleaning material.
 - 3. Remove temporary protective coating by method recommended by coating manufacturer and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.
- B. Protect installed tile work with Kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. Apply coat of sealer to all grout joints and all unglazed tile.
- C. Before final inspection, remove protective coverings from tile surfaces.
- D. Leave finished installation clean and free of cracked, chipped, broken, unbonded or otherwise defective tile work.

END OF SECTION 09 30 13



THIS PAGE INTENTIONALLY LEFT BLANK



SECTION 09 51 53 - DIRECT-APPLIED ACOUSTICAL 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. Direct attachment of acoustical ceiling panels to substrates with adhesive and mechanical fasteners.

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Shop Drawings: Submit completely dimensioned ceiling layouts for all areas where acoustical ceilings are required, showing:
 - 1. Direction, sizes and types of acoustical units, showing location of fasteners, and starting point for each individual ceiling area.
 - 2. Details of construction and installation at all conditions.
 - 3. Materials, gauges, thickness and finishes.
- C. Product Data
- D. Samples
 - 1. Ceiling units: 12" x 12".
 - 2. Mechanical fasteners

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Qualifications of Installers
 - 1. For the actual fabrication and installation of all components of the system, use only personnel who are experienced in the skills required and completely familiar with the requirements established for this work.



2. Installer shall have a record of successful installation of similar ceilings acceptable to the Commissioner.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.

PART 2 PRODUCTS

2.1 ACOUSTICAL CEILING PANELS

- A. Performance Requirements:
 1. Surface-Burning Characteristics: Comply with ASTM E84, Class A.
 - a. Flame-Spread Index: 15 or less.
 - b. Smoke-Developed Index: 250 or less.
 2. Noise Reduction Coefficient (NRC): Not less than 0.70.
- B. Material: Impact resistant, tackable 100% polyester fiber (60% PET-recycled fiber, 40% PET virgin fiber).
- C. Size: 24" x 48" nominal x 1" thick
- D. Color: Beige
- E. Edge Detail: Natural
- F. Basis-of-Design Product: Subject to compliance with requirements, provide Acoustical Solutions; PolyPhon Acoustic Panels or comparable product by one of the following:
 1. Acoustical Surfaces, Inc.
 2. Rhino Acoustic Panel
 3. Or approved equal.

2.2 MISCELLANEOUS MATERIALS

- A. Acoustical Tile Adhesive: Type recommended in writing by acoustical tile manufacturer, bearing UL label for Class 0-25 flame spread.
- B. Fasteners: Screws and washers as recommended by manufacturer.



PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. Adhere and mechanically fasten acoustical units in accordance with manufacturer's installation instructions. Scribe and cut panels to fit accurately at borders and at penetrations.
 - 1. Adhesive Installation: Install acoustical panel by bonding to substrate, using adhesive and procedure recommended in writing by panel manufacturer and as follows:
 - a. Wipe and prime ceiling.
 - b. Remove loose dust from backs of panels by brushing.
 - c. Maintain bottom surface to a uniform level. Shim panel or correct substrate as required to maintain levelness.
 - d. Maintain tight butt joints, aligned in both directions and coordinated with ceiling fixtures.
 - 2. Mechanically Fastened Installation: Fasten acoustical panel to substrate using a minimum of four screws and washers per panel that are installed one at each corner of panel, spaced uniformly, and as follows:
 - a. Maintain bottom surface of tiles to a uniform level. Shim panel or correct substrate as required to maintain levelness.
 - b. Maintain tight butt joints, aligned in both directions and coordinated with ceiling fixtures.

END OF SECTION 09 51 53



THIS PAGE INTENTIONALLY LEFT BLANK



SECTION 09 54 00 - SPECIALTY 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. Baffle ceiling panels
 - 2. Suspension systems
 - 3. Accessories; provide other necessary items including devices for attachment overhead construction, secondary members, splines, splices, connecting clips, wall connectors, wall angles, and other devices required for a complete installation.
 - 4. Supplemental support framing: Provide fully engineered secondary framing as required to meet the New York City Building Code, conforming to layout shown in drawings, to support direct-hung metal ceilings suspension system.
- B. Related Sections
 - 1. Section 09 21 16 "Gypsum Board Assemblies"
- C. This Section covers the general requirements only for Acoustical Metal Ceilings as shown on the drawings. The supplying and installation of additional accessory features and other items not specifically mentioned herein, but which are necessary to make a complete installation, shall also be included or clarified accordingly.

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. A 641 – "Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire"
 - 2. A 653 – "Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip process"
 - 3. B 209 – "Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate"
 - 4. C 423 – "Sound Absorption and Sound Absorption Coefficients by Reverberation Room Method"
 - 5. C 635 – "Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings"



6. C 636 – “Recommended Practice for Installation of Metal Ceiling Suspensions Systems for Acoustical and Lay-in Panels”
7. D 1044 – “Practice for Abrasion Resistance”
8. D 1002 – “Practice for Adhesion Resistance”
9. E 84 – “Standard Test Method for Surface Burning Characteristics of Building Materials”
10. E 488 – “Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements”
11. E 580 – “Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Moderate Seismic Restraint”
12. E 1264 – “Classification for Acoustical Ceiling Products”
13. E 1477 – “Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by use of Integrating-Sphere Reflectometers”

1.4 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.
- B. Product Data: Manufacturer’s published literature, including specifications.
- C. Product Certification: Manufacturer’s certifications that products comply with specified requirements and the New York City Building Code including product data, laboratory test reports and research reports showing compliance with specified standards.
- D. Shop Drawings: Submit shop drawings for reflected ceiling plans (RCP’s), drawn to scale, and indicating penetrations and ceiling mounted items. Show the following details:
 1. Reflected Ceiling Plan(s): Indicating metal ceiling layout, ceiling mounted items and penetrations.
 2. Suspension System, Carrier and Component Layout.
 3. Details of system assembly and connections to building components.
- E. Samples for Verification: Full-size units (or as specified below) of each type of ceiling assembly indicated; in sets for each color, texture, and pattern specified, showing the full range of variations expected in these characteristics. Submit samples for each type specified.
 1. 11" long metal panel units.
 2. 11" long samples of each exposed molding or trim.
 3. 11" long samples of each suspension component.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.



B. Qualification Data:

1. Test Reports: Certified reports from independent agency substantiating compliance to structural and wind load requirements.
2. Certificates:
 - a. Data substantiating manufacturer and installer qualifications.
 - b. Certified data attesting fire rated materials comply with specifications.
 - c. Manufacturer's Instructions: Detailed installation instructions and maintenance data.

C. Manufacturer/Installer Qualifications:

1. Provide metal ceiling system components produced by a single manufacturer with a minimum 3 years' experience in actual production of specified products and with resources to provide consistent quality in appearance and physical properties, without delaying the work.
2. Provide suspension system components produced by a single manufacturer to provide compatible components for a complete metal ceiling system installation.
3. Perform installations using a firm with installers having no less than 3 years of successful experience on projects of similar size and requirements.

D. Regulatory Requirements:

1. Fire Rating Performance Characteristics: Install system to provide a flame spread of 0 - 25, complying with certified testing to ASTM E 84.
2. Structural Criteria: Install and certify system to comply with structural and wind load requirements of the New York City Building Code.
3. Installation Standard for Suspension System: Comply with ASTM C 636.

E. Mock-Up: Prior to beginning installation erect a mock-up section, where directed, using all system components.

F. Pre-installation Conference: Conduct a conference, prior to start of installation, to review system requirements, shop drawings, and all coordination needs.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver system components in manufacturer's original unopened packages, clearly labeled.
- B. Store components in fully enclosed dry space. Carefully place on skids, to prevent damage from moisture and other construction activities.
- C. Handle components to prevent damage to surfaces and edges, and to prevent distortion and other physical damage.

1.7 PROJECT CONDITIONS

- A. Begin system installations only after spaces are enclosed and weather-tight, and after all wet work and overhead work have been completed.



- B. Prior to starting installations, allow materials to reach ambient room temperature and humidity intended to be maintained for occupancy.

1.8 WARRANTY

- A. Provide specified manufacturer's warranty against defects in workmanship, discoloration, or other defect considered undesirable by the Commissioner.
- B. This warranty shall remain in effect for a minimum period of one (1) year from date of Substantial Completion.

1.9 SERVICE

- A. Maintenance Instructions: Provide manufacturer's standard maintenance and cleaning instructions for finishes provided.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Hunter Douglas Architectural, Inc.; High Profile Series straight baffle ceiling system or comparable product by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. CertainTeed Corporation
 - 3. Or approved equal.

2.2 SYSTEM MATERIALS

- A. High Profile Series Straight Beam
 - 1. Baffle Profile:
 - a. Beam Profile: 1 1/2" wide by 6 3/8" deep.
 - 2. Beam Panel Spacing: Approximately 12" on center; refer to drawings.
 - 3. Panel Length: as indicated on drawings.
- B. Beam Suspension System:
 - 1. Interior Applications:
 - a. Hanger Bracket: Patented Ceiling Panel Hanger Bracket with cam-actuated locking device designed to positively lock baffle panel in place, with release device to disengage hanger bracket, allowing panel to slide along Primary Support Channel for access. Hanger Bracket connects baffle panel profile to Primary Support Channel.
 - 1). Finish: Black



- b. Primary Support Channel: 1-5/8" x 1-5/8" Unistrut P1000 Channel with 3/8" return flanges designed to interlock with Panel Hanger Bracket, 20' long. Factory-applied black polyester painted finish. Material: 12 Ga. galvanized steel, GR 33.
- c. Threaded Rod: .375" diameter galvanized steel threaded rod

C. Panel Finish: Wood veneer, white oak, rift cut.

2.3 ACCESSORY MATERIALS

- A. Beam End Caps: Milled end caps to match beam finish
- B. Profile Splices: Mill-finish aluminum splices for joining profiles.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

- A. Coordination: Furnish layouts for cast-in-place anchors, clips, and other ceiling anchors whose installation is specified in other Sections.
- B. Measure each ceiling area and establish layout of acoustical metal pan units to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width units at borders, and comply with layout shown on reflected ceiling plans.
- C. Survey substrate for wall attachment to ensure squareness and proper elevation for wall panel installation.

3.3 INSTALLATION

- A. General: Install acoustical metal pan ceilings, per manufacturers shop drawings provided, per manufacturer's written instructions and to comply with publications referenced below.
 - 1. CISCA "Ceiling Systems Handbook"
 - 2. Standard for Ceiling Suspension System Installations - ASTM C 636
 - 3. Standard for Ceiling Suspension Systems Requiring Seismic Restraint - ASTM E 580
- B. Suspend ceiling hangers from building's approved structural substrates 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, counter-splaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produce hanger spacings that interfere with location of hangers at spacing required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Utilize



supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

4. Where used secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure; that are appropriate for substrate; and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 5. Space hangers not more than 48" on-center, along each member supported directly from hangers, unless otherwise indicated; and provide hangers not more than 12" from ends of each member. Supply supporting calculations from Professional Engineer licensed in the State of New York verifying hanger spacing meets all requirements, when spacing exceeds those recommended.
 6. Level grid to 1/8" in 10'-0" from specified elevation(s), square and true.
 7. Adjust suspension system runners so they are square (within .5 degree from 90 degrees) and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- C. Secure bracing wires to ceiling suspension members and to supports in compliance with New York City Building Code. Suspend bracing from building's structural members and/or structural deck, as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs (unless directed otherwise).
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical metal pan. Method of edge trim attachment and design of edge trims to be approved by Commissioner.
1. Screw attach moldings to substrate at intervals not more than 18" on-center and not more than 6" from ends, leveling with ceiling suspension system to a tolerance of 1/8" in 10'-0". Miter corners accurately and connect securely.
 2. Do not use exposed fasteners, including pop rivets, on moldings and trim without prior written approval, or unless detailed otherwise.
- E. Scribe and cut acoustical metal panel units for accurate fit at 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.
- F. Install acoustical metal panel units in coordination with suspension system.

3.4 ADJUST AND CLEAN

- A. Adjust components to provide uniform tolerances.
- B. Clean exposed surfaces with non-solvent, non-abrasive commercial type cleaner.

END OF SECTION 09 54 00



SECTION 09 64 00 - WOOD 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. Wood flooring and base.
 - 2. Plywood subflooring.
 - 3. Accessories.
 - 4. Field finishing of wood flooring.
- B. Related Sections
 - 1. Section 06 10 00 "Rough Carpentry"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: Submit manufacturer's detailed technical product data and installation instructions for each type of wood flooring. Include instructions for handling, storage, installation, finishing, protection and maintenance.
- C. Samples: Submit sets of range samples for wood flooring; include finish.
 - 1. Include six (6) inch samples of base.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. General Standard: Comply with recommendations of National Wood Flooring Association (NWFA) Installation Guidelines.
- C. Source Quality Control: Obtain flooring of each type from single manufacturer or source, to ensure match of quality, color, pattern and texture.
- D. Installer Qualifications: An entity meeting the requirements of the DDC General Conditions Section 014000 "Quality Requirements," Article 1.7.C.1.



1.5 DELIVERY, STORAGE AND HANDLING

- A. Moisture Content: At time of delivery, limit average moisture content of wood flooring to 6%, with 8% maximum for any piece.
- B. Protect wood flooring from excessive moisture in shipment, storage and handling. Deliver in unopened cartons or bundles and store in a dry place, with adequate air circulation. Do not deliver material to building until "wet work" such as concrete and plaster have been completed and cured to a condition of equilibrium.

1.6 PROJECT CONDITIONS

- A. Conditioning: Do not proceed with installation of wood flooring until spaces have been enclosed. Building must be dry with all wet work (i.e. concrete, plaster, drywall, fireproofing) completed. Further, the building HVAC system must be operating and the space shall have been at the expected ambient temperature and relative humidity for five days. Condition wood for five (5) days prior to start of installation by placing in spaces to receive flooring and maintaining ambient conditions in which it will be used before, during and after installation. Open packages of wood flooring which are sealed to permit natural adjustment of moisture content.

1.7 SPECIAL PROJECT WARRANTY

- A. Submit three (3) year warranty signed by Manufacturer agreeing to repair or replace wood flooring which shrinks, warps, cracks, or otherwise deteriorates excessively, or which breaks its anchorage or bond with substrate or otherwise fails to perform as required, due to failures of materials and/or workmanship and not due to unusual exposure to moisture or other abusive forces or elements not anticipated for application.

PART 2 PRODUCTS

2.1 WOOD MATERIALS

- A. Wood flooring shall be Rift Sawn, Select, White Oak (per NOFMA grading rules), 3/4" thick and 4" face width. Flooring strips shall be tongued-and-grooved and end-matched; back face of each strip shall be back channeled. Strips shall be standard random lengths, complying with grading rules. Wood shall be kiln-dried and moisture content of wood at time of installation shall not exceed 8%.
- B. Plywood Subflooring: 3/4" thick C-D EXT APA Rating Sheathing, Exposure 1. Cover top of plywood with 30 lb. asphalt felt prior to application of wood flooring.
- C. Wood Trim: Where indicated to match wood flooring, provide wood base board molding, base shoe molding and stair risers of same species and grade as wood flooring. Provide wood stripping, nosings, saddles and thresholds, as indicated in or adjacent to wood flooring, of same species, grade and cut as wood flooring.

2.2 WOOD FIELD FINISHING

- A. Urethane Floor Varnish: Provide heavy duty, matte, water-based urethane floor finish equal to "Street Shoe" as manufactured by Basic Coatings, Inc., or equal made by Hillyard Chemical Co., Bona Kemi, MinWax or approved equal.



2.3 ACCESSORIES

- A. Fasteners: Provide screw type flooring nails as recommended by NWFA in "Installation Guidelines Manual."
- B. Cork Expansion Strip: Composition cork expansion strip.
- C. Vapor Barrier: Eight (8) mils polyethylene.
- D. Mastic: Cut black asphalt type.
- E. Perimeter Isolation: 3/8" thick fiberglass board, 6 - 15 pcf.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

- A. Wherever direct application of wood flooring to concrete substrate is indicated, test for dryness before proceeding with installation. If tests show dampness or moisture content in excess of 10%, do not proceed until slab is dry. Wood flooring manufacturer must approved substrate in writing, to the Commissioner prior to start of work of this Section.
- B. Grind high spots and fill low spots on concrete substrates to produce a maximum 1/8-inch deviation in any direction when checked with a 10-foot straight edge. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.
- C. Remove coatings, including curing compounds, and other substances on substrates that are incompatible with installation adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- D. Broom or vacuum clean substrates to be covered immediately before product installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION (GENERAL)

- A. General: Comply with flooring manufacturer's instructions and recommendations, but not less than recommended by NWFA "Installation Guidelines".
- B. Pattern: Comply with pattern or direction of pattern for laying wood flooring, as directed by Commissioner.
- C. Expansion Space: Provide expansion space at walls and other obstructions and terminations of flooring, not less than 1/2". Fill expansion space with flush cork expansion strip. Nail shoe molding or other trim to baseboard, rather than to flooring.
- D. Wood strip flooring shall be securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16" out of plane.



3.4 INSTALLATION OF WOOD FLOORING OVER OSB ON CONCRETE

- A. Cover concrete slab with 8-mil polyethylene vapor barrier set dry on concrete; lap ends and edges 6".
- B. Set 4'-0" x 8'-0" sheets of OSB sub-floor over vapor barrier as follows:
 - 1. Stagger panel joints allowing approximately 1/8" expansion space around all panels to prevent edge peaking due to compression caused by panel swell.
 - 2. Allow 3/4" minimum expansion space at all vertical obstructions.
 - 3. Panels shall be mechanically fastened using NWFA approved fasteners.
 - 4. Fasten 2" from the edge every 6" to 8" along the perimeter of the sheet and one fastener or more spaced every 12" in the interior of the panel. Fasten the center first to prevent the sub-floor from bowing.
- C. Cover plywood with 30 lb. asphalt felt lapping ends and edges 4".
- D. Nail finish wood flooring to plywood substrate, spacing nails 6" o.c. with one nail within 2" of each end of each strip.

3.5 SANDING AND FINISHING

- A. Machine sand installed unfinished flooring to remove offsets and non-level conditions, ridges, cups, and sanding machine marks which would be visually noticeable after finishing. Use three (3) grades of sandpaper, ending with 00 grade. Vacuum clean and immediately apply finish. Do not permit traffic on floor after sanding and until finish is completed. Cover sanded floor with building paper to provide access for application of first finish coats.
- B. Immediately after proper sanding, tack rag with clean-up solvent. Apply a thin coat of varnish. Allow to dry thoroughly. Burnish with #2 steel wool under a single brush floor machine. Tack rag with clean-up solvent. Apply a second and third coats of varnish in same manner.

3.6 PROTECTION

- A. Protect completed wood flooring during remainder of construction period with heavy Kraft paper or other suitable covering, so that flooring and finish will be without damage or deterioration at time of acceptance.

END OF SECTION 09 64 00



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. Rubber base.
 - 2. Accessories.

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Manufacturer's Data: For information only, submit manufacturer's technical information and installation guidelines for type of resilient base.
- C. Samples: Six (6) inches long samples of base.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Qualifications of Installers: Thoroughly instructed and experienced in the skills required and completely familiar with the requirements established for this work.

1.5 DELIVERY AND STORAGE

- A. Deliver materials to the project site in the manufacturer's original unopened containers, clearly marked to indicate pattern, gauge, lot number and sequence of materials.
- B. Carefully handle all materials and store in original containers at not less than seventy (70) degrees F. for at least forty-eight (48) hours before start of installation.

1.6 JOB CONDITIONS

- A. Continuously heat spaces to receive base to a temperature of seventy (70) degrees F. for at least forty-eight (48) hours prior to installation, whenever project conditions are such that heating is required. Maintain seventy (70) degrees F. temperature continuously during and after installation as recommended by the manufacturer, but for not less than forty-eight (48) hours. Maintain a temperature of not less than fifty-five (55) degrees F. in areas where work is completed.



PART 2 PRODUCTS

2.1 RUBBER BASE

- A. Provide 2-1/2" high by 3/8" thick continuous rubber base with rectangular profile and 45 degree chamfer top conforming to ASTM F 1861, Type TP, Group 1 (solid).
 - 1. Color: As selected by Commissioner.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide Tarkett; Johnsonite Millwork Wall Base, Mandalay 2-1/2" (MW-XX-H25) or comparable product by one of the following:
 - 1. Armstrong.
 - 2. Roppe.
 - 3. Or approved equal.

2.2 ACCESSORIES

- A. Adhesives: Waterproof, stabilized type, as recommended by the manufacturer for the type of service indicated.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. In all spaces where base is indicated, install bases tight to walls, partitions, columns, built-in cabinets, etc., without gaps at top or bulges at bottom, with tight joints and flush edges, and mitered inside and outside corners. Keep base in full contact with walls until adhesive sets.

END OF SECTION 09 65 13



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. Carpet tile.
- 2. Adhesive.

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: Submit manufacturer's complete technical product data for each type of carpet, cushion and accessory item required.
- C. Samples: Submit full size samples of carpet tile and six (6) inches long samples of each type exposed edge stripping.
- D. Certification: Submit manufacturer's certification stating that carpet materials furnished comply with specified requirements.
 - 1. Include listing of mill register numbers for carpet furnished.
 - 2. Include supporting certified laboratory test data indicating that carpet meets or exceeds specified test requirements.
- E. Maintenance Data: Submit manufacturer's printed maintenance recommendations, including methods and frequency recommended for maintaining carpet in optimum conditions under anticipated traffic and use conditions.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Installer Qualifications: Firm with not less than three (3) years of experience in installation of commercial carpeting of type, quantity and installation methods similar to work of this Section.
- C. General Terminology/ Information Standard: Refer to current edition of "Carpet Specifier's Handbook" by The Carpet and Rug Institute; for definitions of terminology not otherwise defined herein, and for general recommendations and information.
- D. Carpet used on Project must be from same dye lot for each carpet type.



1.5 PRODUCT DELIVERY AND STORAGE

- A. Deliver carpeting materials in original mill protective wrapping with mill register numbers and tags attached. Store inside, in well ventilated area, protected from weather, moisture and soiling.

1.6 WARRANTY

- A. Provide special project warranty, signed by Manufacturer (Carpet Mill), agreeing to repair or replace defective materials and workmanship of carpeting work during one (1) year warranty period following substantial completion. Attach copies of product warranty.

PART 2 PRODUCTS

2.1 CARPET TILE

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Milliken & Company; Lapidus Collection, Mantle, MAN106 Quartz or comparable product by one of the following:
 - 1. Mohawk Group (The); Mohawk Carpet. LLC
 - 2. Shaw Contract Group; a Berkshire Hathaway company.
 - 3. Or approved equal.
- B. Tile Size: 1m x 1m (39.4" x 39.4")
- C. Layout Pattern: As indicated on finish floor plan on drawings.

2.2 ACCESSORIES

- A. Adhesive for Carpet Tile: Provide release type adhesive as recommended by the carpet tile manufacturer for use with carpet tile specified. Provide adhesive which complies with flame spread rating required for the carpet installation.
- B. Miscellaneous Materials: Provide the types of adhesives and tape, and other accessory items recommended by the carpet manufacturer and Installer for the conditions of installation and use.
- C. Leveling Compound: Latex/Portland cement flash patching and leveling compound equal to No. DSP-504 made by Specialty Construction Brands Inc, or No. 226 with 3701 admixture made by Laticrete or equal made by Mapei, or approved equal.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 PRE-INSTALLATION REQUIREMENTS

- A. Floor shall be clean and free of cracks and protrusions. Any gaps or cracks more than 1/16" wide to be filled in with latex leveling compound. Protrusions must be sanded down smooth, the floor cleanly swept and vacuumed if necessary to remove all dust and grit.



- B. Floor temperature shall be 65 deg., at least 24 hours prior to installation; and 48 hours after carpet is installed.
- C. Conduct a moisture test. The presence of moisture in the concrete floor will interfere with the curing and subsequent performance of the adhesive. Conduct the test as follows:
 - 1. Drive a concrete nail a half inch into the floor. Then remove the nail.
 - 2. Place a small amount of anhydrous calcium chloride or calcium sulphate crystals over the hole.
 - 3. Cover the crystals and the hole with a piece of flat glass and seal the edges with waterproof tape or putty. Since concrete pourings vary, repeat the test every 1500 sq. ft.
 - 4. Leave in place 72 hours. Any color change in the crystals indicates the presence of moisture. Do not apply carpet until slab is free of moisture and meets with approval of carpet adhesive manufacturer.
- D. Sequence carpeting with other work so as to minimize possibility of damage and soiling of carpet during remainder of construction period.

3.3 INSTALLATION

A. General

- 1. Comply with manufacturer's instructions and recommendations. Maintain direction of pattern and texture, including lay of pile.
- 2. Adhere all tiles with a full spread of adhesive. Dry-fit cut tiles and apply adhesive to tile back after tile has been cut.
- 3. Install tiles in a monolithic corner to corner manner following arrows printed on back of each tile indicating pile direction. Install tiles to achieve patterns as directed by the Commissioner.
- 4. Scribe tiles precisely to perimeter and install precisely without gaps or level changes since vinyl reducer strip to cover up any inconsistencies is not acceptable.

3.4 CLEANING UP

- A. Upon completion of the carpeting installation in each area, visually inspect all carpet installed in that area and immediately remove all dirt, soil, and foreign substance from the exposed face; inspect all adjacent surfaces and remove all marks and stains caused by the carpet installation: remove all packaging materials, carpet scraps, and other debris from the carpet installation to the area of the job site set aside for its storage.

3.5 PROTECTION

- A. In all areas, provide a temporary non-staining paper pathway in the direction of traffic.

END OF SECTION 09 68 13



**Department of
Design and
Construction**

FMS No. - LNCA13HAM
Issue Date - 04/15/2022

THIS PAGE INTENTIONALLY LEFT BLANK



SECTION 09 84 13 – FIXED SOUND-ABSORPTIVE 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. Decorative, acoustically-absorbent panels.

- B. Related Sections

1. Section 06 10 00 "Rough Carpentry"
2. Section 09 21 16 "Gypsum Board Assemblies"

1.2 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

- B. Shop Drawings/Product Data

1. Base drawings on field measurements.
2. Show dimensioned wall elevations with seam and joint locations, cutout sizes and locations, anchor locations, relation to adjacent work; large scale joint and mounting details; materials type, weight/thickness, design, color; and other data necessary to fabricate and install work and coordinate work with affected trades.

- C. Samples: 12" x 12" (minimum) panels in selected finish, showing seam, edge and cutout conditions.

- D. Certification

1. Acoustical Performance: Certified reports of acoustical performance tests conducted and/or witnessed by a recognized, independent, testing agency. Tests shall have been done by specified methods or recognized equivalent. Sound absorption tests shall be not more than three years old. Reports on earlier tests are acceptable if it can be established to the Commissioner's satisfaction, that they are valid indications of compliance with Project requirements.

2. Fire Hazard: Evidence of compliance with regulatory agency and specifications requirements.

- E. Cleaning and Maintenance Instructions: Recommendations for maintenance and cleaning of fixed sound-absorptive panels. Identify cleaning products generically or by trade name.

- F. Manufacturer Qualifications.



1.3 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Manufacturer Qualification: At least 3 years' experience fabricating and installing comparable work.

1.4 REFERENCES

- A. ASTM C 423 Test for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
- B. ASTM E 84 Test for Surface Burning Characteristics of Building Materials.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Allow materials to become acclimated to Project conditions before installation, if necessary to prevent sag and distortion during service life.

1.6 PROJECT CONDITIONS

- A. Environmental Conditions
 - 1. Work areas shall be at or near ambient occupancy temperature and relative humidity.
 - 2. Painting, dust-raising activities, and work that introduces dampness shall be completed.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Decorative, Acoustically-Absorbent Panels - Basis-of-Design Product: Subject to compliance with requirements, provide Fitzfelt Akustika 10 Wall with Interlocking Mounting System, NRC 0.75, or comparable product by one of the following:
 - 1. BuzzSpace
 - 2. Bossfelt
 - 3. Or approved equal.

2.2 GENERAL

- A. Fabricate panels to sizes and configurations indicated.
- B. Dimensional Tolerances of Finished Units: Overall height and width of panels, plus or minus 1/16".
- C. Sound Absorption Performance: Provide acoustical wall panels with minimum noise reduction coefficients (NRC) indicated, as determined by testing per ASTM C 423 for mounting type specified under individual product requirements.



- D. Colors, Textures, and Patterns: Where manufacturer's standard material is indicated, provide acoustical wall panels faced with manufacturer's material complying with the following requirements:

1. Color: Gray.

2.3 ACCESSORIES

- A. Mechanical Fasteners: Manufacturer's standard or recommended mechanical fasteners for securely mounting panels of type and size indicated to substrates provided.
- B. Mounting System: Manufacturer's Interlocking Mounting System designed to support full weight of panels; with both designed to allow panel removal.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. General

1. Install acoustical wall panels in locations indicated with vertical surfaces and edges plumb, top edges level and in alignment with other panels, scribed to fit adjoining work accurately at borders and at penetrations. Comply with panel manufacturer's printed instructions for installation of panels using type of mounting accessories indicated or, if none indicated, as recommended by manufacturer.
2. Construction Tolerances
 - a. Variation from Plumb and Level: $\pm 1/16"$.
 - b. Variation of Joints from Hairline: Not more than $1/16"$.

3.3 ADJUSTING AND CLEANING

- A. Adjust and clean panels according to manufacturer's written instructions.

END OF SECTION 09 84 13



THIS PAGE INTENTIONALLY LEFT BLANK



SECTION 09 90 00 - PAINTING AND COATING

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. Prime painting unprimed surfaces to be painted under this Section.
2. Painting all items furnished with a prime coat of paint, including touching up or repairing of abraded, damaged or rusted prime coats applied by others.
3. Painting all ferrous metal (except stainless steel) exposed to view.
4. Painting all galvanized ferrous metals exposed to view.
5. Painting interior concrete block exposed to view.
6. Painting gypsum drywall exposed to view.
7. Sealing concrete floors.
8. Painting of wood exposed to view, except items which are specified to be painted or finished under other Sections of these specifications. Back painting of all wood in contact with concrete, masonry or other moisture areas.
9. Painting pipes, pipe coverings, conduit, ducts, insulation, hangers, supports and other mechanical and electrical items and equipment exposed to view.
10. Painting surfaces above, behind or below grilles, gratings, diffusers, louvers, lighting fixtures, and the like, which are exposed to view through these items.
11. Incidental painting and touching up as required to produce proper finish for painted surfaces, including touching up of factory finished items.
12. Painting of any surface not specifically mentioned to be painted herein or on drawings, but for which painting is obviously necessary to complete the job, or work which comes within the intent of these specifications, shall be included as though specified.

- B. Related Sections

1. Section 08 44 13 "Glazed Aluminum Curtain Walls"
2. Section 09 21 16 "Gypsum Board Assemblies"



3. Shop priming is required on some, but not all of the items scheduled to be field painted. Refer to other Sections of work for complete description.
4. Shop Coat on Machinery and Equipment: Refer to the Sections under which various items of manufactured equipment with factory applied shop prime coats are furnished. All items of equipment furnished with prime coat finish shall be finish painted under this Section.
5. Color Coding of Mechanical Piping and Electrical Conduits
 - a. Identification for Plumbing Piping and Equipment - Section 22 05 53.
 - b. Identification for HVAC Piping and Equipment - Section 23 05 53.
 - c. Identification for Electrical Systems - Section 26 05 53.
 - d. Color Coding consists of an adhesive tape system and is in addition to painting of piping and conduits under this Section, as specified above.

1.3 MATERIALS AND EQUIPMENT NOT TO BE PAINTED

- A. Items of equipment furnished with complete factory finish, except for items specified to be given a finish coat under this Section.
- B. Factory-finished toilet partitions.
- C. Factory-finished acoustical tile.
- D. Non-ferrous metals, except for items specified and/or indicated to be painted.
- E. Finished hardware, excepting hardware that is factory primed.
- F. Surfaces not to be painted shall be left completely free of droppings and accidentally applied materials resulting from the work of this Section.

1.4 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Materials List
 1. Before any paint materials are delivered to the job site, submit to the Commissioner a complete list of all materials proposed to be furnished and installed under this portion of the work.
 2. This shall in no way be construed as permitting substitution of materials for those specified or accepted for this work by the Commissioner.
- C. Samples
 1. Accompanying the materials list, submit to the Commissioner copies of the full range of colors available in each of the proposed products.
 2. Upon direction of the Commissioner, prepare and deliver to the Commissioner two (2) identical sets of Samples of each of the selected colors and glosses painted onto 8-1/2" x 11" x 1/4" thick material; whenever possible, the material for Samples shall be the same material as that on which the coating will be applied in the work.



- D. **Manufacturer's Recommendations:** In each case where material proposed is not the material specified or specifically described as an acceptable alternate in this Section of these specifications, submit for the Commissioner's review the current recommended method of application published by the manufacturer of the proposed material.
- E. **Close out Submittal**
 - 1. **Coating Maintenance Manual:** Upon conclusion of the project, the Contractor or plant manufacturer/supplier shall furnish a coating maintenance manual such as Sherwin Williams "Custodian Project Color and Product Information" report or equal. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product/color/finish was used, product data pages, MSDS, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. **Job Mock-Up**
 - 1. In addition to the samples specified herein to be submitted for approval, apply in the field, at their final location, each type and color of approved paint materials, applied 10 feet wide, floor to ceiling of wall surfaces, before proceeding with the remainder of the work, for approval by the Commissioner. Paint mock-ups to include door and frame assembly.
 - 2. These applications when approved will establish the quality and workmanship for the work of this Section.
 - 3. Repaint individual areas which are not approved, as determined by the Commissioner, until approval is received. Assume at least two paint mock-ups of each color and gloss for approval.
- C. **Qualification of Painters:** Use only qualified journeyman painters for the mixing and application of paint on exposed surfaces.
- D. **Paint Coordination:** Provide finish coats which are compatible with the prime paints used. Review other Sections of these specifications in which prime paints are to be provided to ensure compatibility of the total coatings system for the various substrates. Upon request from other subcontractors, furnish information on the characteristics of the finish materials proposed to be used, to ensure that compatible prime coats are used. Provide barrier coats over incompatible primers or remove and re-prime as required. Notify the Commissioner in writing of any anticipated problems using the coating systems as specified with substrates primed by others.
- E. All paints must conform to the Volatile Organic Compounds (VOC) standards of prevailing codes and ordinances.

1.6 PRODUCT HANDLING

- A. Deliver all paint materials to the job site in their original unopened containers with all labels intact and legible at time of use.
- B. **Protection**



1. Store only the approved materials at the job site, and store only in a suitable and designated area restricted to the storage of paint materials and related equipment.
2. Use all means necessary to ensure the safe storage and use of paint materials and the prompt and safe disposal of waste.
3. Use all means necessary to protect paint materials before, during and after application and to protect the installed work and materials of all other trades.

C. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

1.7 JOB CONDITIONS

- A. Apply water-based paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 50 degrees F. and 90 degrees F., unless otherwise permitted by the paint manufacturer's printed instructions.
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 45 degrees F. and 95 degrees F. unless otherwise permitted by the paint manufacturer's printed instructions.
- C. Do not apply paint in snow, rain, fog or mist; or when the relative humidity exceeds eighty-five (85) percent; or to damp or wet surfaces; unless otherwise permitted by the paint manufacturer's printed instructions.
- D. Painting may be continued during inclement weather only if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified by the paint manufacturer during application and drying periods.

PART 2 PRODUCTS

2.1 PAINT MANUFACTURERS

- A. Except as otherwise noted, provide the painting products listed for all required painting made by Benjamin Moore, Akzo Nobel Paint (Glidden Professional), and Sherwin Williams (S-W), or an approved equal. Comply with number of coats and required minimum mil thicknesses as specified herein.

2.2 MATERIALS

- A. Provide undercoat paint produced by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer, and use only to recommended limits.
- B. Colors and Glosses: All colors and glosses shall be as selected by the Commissioner. Certain colors will require paint manufacturer to prepare special factory mixes to match colors selected by the Commissioner. Color schedule (with gloss) shall be furnished by the Commissioner.
- C. Coloring Pigment: Products of or furnished by the manufacturer of the paint or enamel approved for the work.
- D. Linseed Oil: Raw or boiled, as required, of approved manufacture, per ASTM D 234 and D 260, respectively.



- E. Turpentine: Pure distilled gum spirits of turpentine, per ASTM D 13.
- F. Shellac: Pure gum shellac (white or orange) cut in pure denatured alcohol using not less than four (4) lbs. of gum per gallon of alcohol.
- G. Driers, Putty, Spackling Compound, Patching Plaster, etc.: Best quality, of approved manufacture.
- H. Heat Resistant Paint: Where required, use heat resistant paint when applying paint to heating lines and equipment.

2.3 GENERAL STANDARDS

- A. The various surfaces shall be painted or finished as specified below in Article 2.4. However, the Commissioner reserves the right to change the finishes within the range of flat, semi-gloss or gloss, without additional cost to the City of New York.
- B. All paints, varnishes, enamels, lacquers, stains and similar materials must be delivered in the original containers with the seals unbroken and label intact and with the manufacturer's instructions printed thereon.
- C. All painting materials shall bear identifying labels on the containers with the manufacturer's instructions printed thereon.
- D. Paint shall not be badly settled, caked or thickened in the container, shall be readily dispersed with a paddle to a smooth consistency and shall have excellent application properties.
- E. Paint shall arrive on the job color-mixed except for tinting of under-coats and possible thinning.
- F. All thinning and tinting materials shall be as recommended by the manufacturer for the particular material thinned or tinted.
- G. It shall be the responsibility of the Contractor to see that all mixed colors match the color selection made by the Commissioner prior to application of the coating.

2.4 SCHEDULE OF FINISHES

- A. High Performance Coating On Exterior Galvanized Ferrous Metals
 - 1. First Coat: "27 Typoxy" or "N69 Epoxoline II" by Tnemec; "Intergard 345" by International Protective Coatings; "Carboguard 893 SG" or "Carboguard 888" by Carboline; "Devran 203 WB Epoxy Primer" by Akzo; Epoxy Mastic Coating V 160 Series by Cortech/Moore or "Recoatable Epoxy Primer 867-45" by Sherwin Williams, or approved equal.
 - 2. Second Coat: "V73 Endura Shield" or "1074/1075" by Tnemec; "Interthane 870UHS" or "990 UHS" by International Protective Coatings; "Carbothane 133 LH" by Carboline; "Devthane 379UH Aliphatic Vizethne" by Akzo; Acrylic Aliphatic Urethane V 500 (Gloss) or V 510 (Semi-Gloss) by Corotech/Moore or "Hi-Solids Urethane B65-300/350" by Sherwin Williams, or approved equal.
- B. High Performance Coating On Exterior Non-Galvanized Ferrous Metals and Topcoat =
 - 1. Prime Coat: "Tneme-Zinc 90/97" by Tnemec; "Interzinc 52" or "315" by International Protective Coatings; "Carbozinc 859, Class B" by Carboline; "Cathacoat 302V Reinforced Inorganic Zinc Primer" by Akzo; Organic Zinc Rich Primer V 170 by Corotech/Moore or "Zinc Clad II Plus Inorganic Zinc Rich Coating B69V212" by Sherwin Williams, or approved equal.



2. Second Coat: "27 Typoxy" or "N69 Epoxoline II" by Tnemec; "Intergard 345" by International Protective Coatings; "Carboguard 893 SG" or "Carboguard 888" by Carboline; "Bar-Rust 231V Multi Purpose Epoxy Mastic" by Akzo; Epoxy Mastic Coating V 160 Series by Corotech/Moore or "Macropoxy 646 I.C. Epoxy B58-600" by Sherwin Williams, or approved equal.
3. Third Coat: "V73 Endura Shield" or "1074/1075" by Tnemec; "Interthane 870UHS" or "990 UHS" by International Protective Coatings; "Carbothane 133 LH" by Carboline; "Devthane 379 UH Aliphatic Urethane" by Akzo; Acrylic Aliphatic Urethane V 500 (Gloss) or V 510 (Semi-Gloss) by Corotech/Moore or "Hi-Solids Polyurethane B65-300/350" by Sherwin Williams, or approved equal.

C. Interior Ferrous Metal

1. Semi-Gloss Finish/Latex

- a. Primer
 - 1). 1 coat Ben Moore Super Spec-HP Acrylic Metal Primer (P04)
 - 2). 1 coat Akzo Devflex 4020 PF DTM Primer/Flat Finish or touch-up shop primer.
 - 3). 1 coat Sherwin-Williams, Pro Industrial Pro-Cryl Universal Primer B66-310
 - 4). Or approved equal.
- b. First Coat
 - 1). 1 coat Moore Ultra Spec HP DTM Acrylic Semi-Gloss (P29)
 - 2). 1 coat Akzo: Glidden Professional Diamond 350 Acrylic S/G 6P1407
 - 3). 1 coat S-W Pro-Classic Waterborne Acrylic Semi-Gloss, B31
 - 4). Or approved equal.
- c. Second Coat:
 - 1). 1 coat Moore Ultra Spec HP DTM Acrylic Semi-Gloss (P29)
 - 2). 1 coat Akzo: Glidden Professional Diamond 350 Acrylic S/G 6P1407
 - 3). 1 coat S-W Pro-Classic Waterborne Acrylic Semi-Gloss, B31
 - 4). Or approved equal.
- d. Total DFT not less than: 4.0 mils

D. Interior Concrete Block

1. Semi-Gloss Finish/Vinyl Acrylic Latex over Filler

- a. Block Filler
 - 1). 1 coat Ben Moore Super Spec Masonry Int./Ext. High Build Block Filler (206)
 - 2). 1 coat Akzo Glidden Professional Concrete Coatings Block Filler GP3010-1200
 - 3). 1 coat S-W Preprite Block Filler, B25W25
 - 4). Or approved equal.
- b. First Coat
 - 1). 1 coat Ben Moore Ultra Spec 500 Interior Latex Gloss (N540)
 - 2). 1 coat Akzo Glidden Professional Diamond 350 Acrylic S/G GP 1407
 - 3). 1 coat S-W Promar 200 Zero VOC Interior Latex S. Gloss, B31-2600
 - 4). Or approved equal.
- c. Second Coat
 - 1). 1 coat Ben Moore Ultra Spec 500 Interior Latex Gloss (N540)
 - 2). 1 coat Akzo Glidden Professional Diamond 350 Acrylic S/G GP 1407
 - 3). 1 coat S-W Promar 200 Zero VOC Interior Latex S. Gloss, B31-2600
 - 4). Or approved equal.
- d. Total DFT not less than: 10.7 mils



E. Interior Drywall

1. Flat Finish/Vinyl Acrylic Latex

a. Primer

- 1). 1 coat Ben Moore Ultra Spec 500 Interior Latex Primer (N534)
- 2). 1 coat Akzo Glidden Professional Gripper GP 3210
- 3). 1 coat S-W Promar 200 Interior Latex Primer
- 4). Or approved equal.

b. First Coat

- 1). 1 coat Ben Moore Ultra Spec 500 Latex Flat (N536)
- 2). 1 coat Akzo Glidden Professional Diamond 350 Flat GP 1201
- 3). 1 coat S-W Promar 200 Zero VOC Interior Latex Flat, B30-2600
- 4). Or approved equal.

c. Second Coat

- 1). 1 coat Ben Moore Ultra Spec 500 Latex Flat (N536)
- 2). 1 coat Akzo Glidden Professional Diamond 350 Flat GP 1201
- 3). 1 coat S-W Promar 200 Zero VOC Interior Latex Flat, B30-2600
- 4). Or approved equal.

d. Total DFT not less than: 3.6 mils

2. Eggshell Finish/Vinyl Acrylic Latex

a. Primer

- 1). 1 coat Ben Moore Ultra Spec 500 Interior Latex Primer (N534)
- 2). 1 coat Akzo Glidden Professional Gripper GP 3210
- 3). 1 coat S-W Promar 200 Interior Latex Primer,
- 4). Or approved equal.

b. First Coat

- 1). 1 coat Ben Moore Ultra Spec 500 Interior Latex Eggshell (N538)
- 2). 1 coat Akzo Glidden Professional Diamond 350 Acrylic Eggshell GP 1403
- 3). 1 coat S-W Promar 200 Zero VOC Interior Latex Egg-Shell, B20-2600
- 4). Or approved equal.

c. Second Coat

- 1). 1 coat Ben Moore Ultra Spec 500 Interior Latex Eggshell (N538)
- 2). 1 coat Akzo Glidden Professional Diamond 350 Acrylic Eggshell GP 1403
- 3). 1 coat S-W Promar 200 Zero VOC Interior Latex Egg-Shell B20-2600
- 4). Or approved equal.

d. Total DFT not less than: 3.8 mils

F. Interior Painted Wood

1. Satin Finish/Latex

a. Primer

- 1). 1 coat Ben Moore Advance Waterborne Int. Alkyd Primer (790)
- 2). 1 coat Akzo Glidden Professional Gripper GP 3210
- 3). 1 coat S-W Premium Wall and Wood Primer B28W111
- 4). Or approved equal.



- b. First Coat
 - 1). 1 coat Moore Advance Waterborne Int. Alkyd Satin (792)
 - 2). 1 coat Akzo Glidden Professional Diamond 350 Acrylic Eggshell GP 1403
 - 3). 1 coat S-W Pro Classic Interior WB, Acrylic/Alkyd Classic B20.
 - 4). Or approved equal.
 - c. Second Coat
 - 1). 1 coat Ben Moore Advance Waterborne Int. Alkyd Satin (792)
 - 2). 1 coat Akzo Glidden Professional Diamond 350 Acrylic Eggshell GP 1403
 - 3). 1 coat S-W Pro Classic Interior WB, Acrylic/Alkyd Classic B20.
 - 4). Or approved equal.
 - d. Total DFT not less than: 4.0 mils
2. Semi-Gloss Finish/Latex
- a. Primer
 - 1). 1 coat Ben Moore Advance Waterborne Int. Alkyd Primer (790)
 - 2). 1 coat Akzo Glidden Professional Gripper GP 3210
 - 3). 1 coat S-W Premium Wall and Wood Primer B28W111
 - 4). Or approved equal.
 - b. First Coat
 - 1). 1 coat Ben Moore Advance Waterborne Int. Alkyd (793)
 - 2). 1 coat Akzo Glidden Professional Diamond 350 Acrylic S/G GP 1407
 - 3). 1 coat S-W Pro Classic Interior WB, Acrylic/Alkyd Classic Semi-Gloss B31
 - 4). Or approved equal.
 - c. Second Coat
 - 1). 1 coat Ben Moore Advance Waterborne Int. Alkyd (793)
 - 2). 1 coat Akzo Glidden Professional Diamond 350 Acrylic S/G GP 1407
 - 3). 1 coat S-W Pro Classic Interior WB, Acrylic/Alkyd Classic Semi-Gloss B31
 - 4). Or approved equal.
 - d. Total DFT not less than: 3.8 mils
- G. Concrete Floor Sealer: Water-based, low-VOC acrylic sealer, "Everclear VOX" as manufactured by Euclid Chemical Company, "V-Seal 101" as manufactured by V-Seal, penetrating sealer by Seal-Krete, or approved equal.

2.5 PIPING AND MECHANICAL EQUIPMENT EXPOSED TO VIEW

- A. Paint all exposed piping, conduits, ductwork and mechanical and electrical equipment. Use heat resisting paint when applied to heating lines and equipment. The Contractor is cautioned not to paint or otherwise disturb moving parts in the mechanical systems. Mask or otherwise protect all parts as required to prevent damage.
- B. Exposed Uncovered Ductwork, Piping, Hangers and Equipment: Latex Enamel Undercoater and one (1) coat Acrylic Latex Flat.
- C. Exposed Covered Piping, Duct Work and Equipment: Primer/Sealer and one (1) coat Acrylic Latex Flat.
- D. Panel Boards, Grilles and Exposed Surfaces of Electrical Equipment: Latex Enamel Undercoater and two (2) coats Latex Semi-Gloss.



- E. Equipment or Apparatus with Factory-Applied Paint: Refinish any damaged surfaces to match original finish. Do not paint over name plates and labels.
- F. All surfaces of insulation and all other work to be painted shall be wiped or washed clean before any painting is started.
- G. All conduit, boxes, distribution boxes, light and power panels, hangers, clamps, etc., are included where painting is required.
- H. All items of Mechanical and Electrical trades which are furnished painted under their respective Contracts shall be carefully coordinated with the work of this Section so as to leave no doubt as to what items are scheduled to be painted under this Section.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL WORKMANSHIP REQUIREMENTS

- A. Only skilled mechanics shall be employed. Application may be by brush or roller. Spray application only upon acceptance from the Commissioner in writing.
- B. Contractor shall furnish the Commissioner a schedule showing completion of the respective coats of paint for the various areas and surfaces. This schedule shall be kept current as the job progresses.
- C. Contractor shall protect the work at all times, and protect all adjacent work and materials by suitable covering or other method during progress of the work. Upon completion of the work, remove all paint and varnish spots from floors, glass and other surfaces. Remove from the premises all rubbish and accumulated materials of whatever nature not caused by other trades and leave the work in clean, orderly and acceptable condition.
- D. Remove and protect hardware, accessories, device plates, lighting fixtures, and factory finished work, and similar items, or provide ample in place protection. Upon completion of each space, carefully replace all removed items by workmen skilled in the trades involved.
- E. Remove electrical panel box covers and doors before painting walls. Paint separately and re-install after all paint is dry.
- F. All materials shall be applied under adequate illumination, evenly spread and flowed on smoothly to avoid runs, sags, holidays, brush marks, air bubbles and excessive roller stipple.
- G. Coverage and hide shall be complete. When color, stain, dirt or undercoats show through final coat of paint, the surface shall be covered by additional coats until the paint film is of uniform finish, color, appearance and coverage, at no additional cost to the City of New York.
- H. All coats shall be dry to manufacturer's recommendations before applying succeeding coats.
- I. Do not apply paint behind frameless mirrors that use mastic for adhering to wall surface.



3.3 PREPARATION OF SURFACES

A. General

1. The Contractor shall be held wholly responsible for the finished appearance and satisfactory completion of painting work. Properly prepare all surfaces to receive paint, which includes cleaning, sanding, and touching-up of all prime coats applied under other Sections of the work. Broom clean all spaces before painting is started. All surfaces to be painted or finished shall be perfectly dry, clean and smooth.
2. Perform all preparation and cleaning procedures in strict accordance with the paint manufacturer's instructions and as herein specified, for each particular substrate condition.
3. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease with clean cloths and cleaning solvents prior to mechanical cleaning. Program the cleaning and painting so that dust and other contaminants from the cleaning process will not fall in wet, newly painted surfaces.

B. Metal Surfaces

1. Weld Fluxes: Remove weld fluxes, splatters, and alkali contaminants from metal surfaces in an approved manner and leave surface ready to receive painting.
 2. Bare Metal: Thoroughly clean off all foreign matter such as grease, rust, scale and dirt before priming coat is applied. Clean surfaces, where solder flux has been used, with benzene. Clean surfaces by flushing with mineral spirits. For aluminum surfaces, wipe down with an oil free solvent prior to application of any pre-treatment.
 - a. Bare metal to receive high performance coating specified herein must be blast cleaned SSPC SP-6 prior to application if field applied primer; coordinate with steel trades furnishing ferrous metals to receive this coating to ensure that this cleaning method is followed.
 3. Shop Primed Metal: Clean off foreign matter as specified for "Bare Metal." Prime bare, rusted, abraded and marred surfaces with approved primer after proper cleaning of surfaces. Sandpaper all rough surfaces smooth.
 4. Galvanized Metal: Prepare surface as per the requirements of ASTM D 6386.
 5. Metal Filler: Fill dents, cracks, hollow places, open joints and other irregularities in metal work to be painted with an approved metal filler suitable for the purpose and meeting the requirements of the related Section of work; after setting, sand to a smooth, hard finish, flush with adjoining surface.
- C. Gypsum Drywall Surfaces: Scrape off all projections and splatters, spackles all holes or depressions, including taped and spackled joints, sand smooth. Conform to standards established in Section 09 21 16, "Gypsum Board Assemblies."
- D. Wood Surfaces: Sand to remove all roughness, loose edges, splinters, or splinters and then brush to remove dust. Wash off grease or dirt with an approved cleaner. Fill all cracks, splits, nail holes, screw holes, and surface defects with putty after the priming coat has been applied. Putty shall be brought up flush with the surface and sanded smooth and touched-up with primer when dry.
- E. Block Masonry Surfaces: Thoroughly clean off all grit, grease, dirt mortar drippings or splatters, and other foreign matter. Remove nibs or projections from masonry surfaces. Fill cracks, holes or voids, not filled



under Section 04 20 00 Unit Masonry, with Portland cement grout, and bag surface so that it has approximately the same texture as the adjacent masonry surface.

- F. Testing for Moisture Content: Contractor shall test all masonry and drywall surfaces for moisture content using a reliable electronic moisture meter. Contractor shall also test latex type fillers for moisture content before application of top coats of paint. Do not apply any paint or sealer to any surface or to latex type filler where the moisture content exceeds seven (7) percent as measured by the electronic moisture meter.
- G. Touch-Up: Prime paint all patched portions in addition to all other specified coats.

3.4 MATERIALS PREPARATION

- A. Mix and prepare painting materials in strict accordance with the manufacturer's directions.
- B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing, and application of paint in a clean condition, free of foreign materials and residue.
- C. Stir all materials before application to produce a mixture of uniform density, and as required during the application of the materials. Do not stir any film which may form on the surface into the material. Remove the film and, if necessary, strain the material before using.
- D. Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are to be applied. Tint undercoats to match the color of the finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

3.5 APPLICATION

- A. General: Apply paint by brush or roller in accordance with the manufacturer's directions. Use brushes best suited for the type of material being applied. Use rollers of carpet, velvet back, or high pile sheep's wool as recommended by the paint manufacturer for material and texture required.
 - 1. The number of coats and paint film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has completely dried. Sand between each enamel or varnish coat application with fine sandpaper, or rub surfaces with pumice stone where required to produce an even, smooth surface in accordance with the coating manufacturer's directions.
 - 2. Apply additional coats when undercoats, stains, or other conditions show through the final coat of paint, until the paint film is of uniform finish, color and appearance. Give special attention to ensure that all surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a film thickness equivalent to that of flat surfaces.
 - 3. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - a. "Exposed surfaces" is defined as those areas visible when permanent or built-in fixtures, convector covers, covers for finned tube radiation, grilles, etc., are in place in areas scheduled to be painted.
 - 4. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint, before final installation of equipment.
 - 5. Paint the back sides of access panels, removable or hinged covers to match the exposed surfaces.



6. Finish doors on tops, bottoms, and side edges the same as the faces, unless otherwise indicated.
7. Enamel finish applied to wood or metal shall be sanded with fine sandpaper and then cleaned between coats to produce an even surface.
8. Paste wood filler applied on open grained wood after beginning to flatten, shall be wiped across the grain of the wood, then with a circular motion, to secure a smooth, filled, clean surface with filler remaining in open grain only. After overnight dry, sand surface with the grain until smooth before applying specified coat.

B. Scheduling Painting

1. Apply the first coat material to surfaces that have been cleaned, pre-treated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
2. Allow sufficient time between successive coatings to permit proper drying. Do not re-coat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

C. Prime Coats: Re-coat primed and sealed walls and ceilings where there is evidence of suction spots or unsealed areas in first coat, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

D. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage.

E. Touching-Up of Factory Finishes: Unless otherwise specified or shown, materials with a factory finish shall not be painted at the project site. To touch up, the Contractor shall use the factory finished material manufacturer's recommended paint materials to repair abraded, chipped, or otherwise defective surfaces.

3.6 PROTECTION AND CLEANING

A. Protect work of other trades, whether to be painted or not, against damage by the painting and finishing work. Leave all such work undamaged. Correct any damages by cleaning, repairing or replacing, and repainting, as acceptable to the Commissioner.

B. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.

C. Cleaning: During the progress of the work, remove from the site all discarded paint materials, rubbish, cans and rags at the end of each work day.

1. Upon completion of painting work, clean window glass and other paint spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
2. At the completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

END OF SECTION 09 90 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. Interior panel signs.
 - 2. Exterior metal dimensional signs.
 - 3. Decal window signs and graphics.
 - 4. Exterior metal pin-mounted graphics.
 - 5. Branch plaque.
 - 6. Desk and shelf signs.
 - 7. Miscellaneous signage and graphics as shown and detailed on drawings.

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: Submit manufacturer's technical data and installation instructions for each type of signage required.
- C. Samples: Submit samples of each type of signage showing finishes, colors, surface textures and qualities of manufacture and design of each sign component including graphics.
- D. Shop Drawings: Submit shop drawings for fabrication and erection of signage. Include plans, elevations, and large scale details of sign wording and lettering layout. Show anchorage and accessory items. Furnish location template drawings for items supported or anchored to permanent construction.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. For actual installation of signage, use only personnel who are thoroughly familiar with the manufacturer's recommended methods of installation and who are experienced in the required skills.



1.5 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during, and after installation, and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

PART 2 PRODUCTS

2.1 INTERIOR PANEL SIGNS

- A. Aluminum Sheet and Plate: ASTM B209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.
- B. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.
- C. Tactile Characters: Characters and Grade 2 Braille raised 1/32 inch above surfaces, in contrasting color.

2.2 EXTERIOR METAL DIMENSIONAL SIGNS

- A. Cutout Characters: Characters with uniform faces; square-cut, smooth, eased edges; precisely formed lines and profiles. Comply with requirements indicated for finish, style and size.
- B. Aluminum Sheet and Plate: ASTM B209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.
- C. Superior-Performance Organic Finish, Three-Coat PVDF: 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. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 2. Color and Gloss: As indicated on Drawings.

2.3 DECAL WINDOW SIGNS AND GRAPHICS

- A. Field-Applied, Vinyl-Character Sign: Prespaced characters die cut from 3- to 3.5-mil thick, weather-resistant vinyl film with release liner on the back and carrier film on the front for on-site alignment and application.
 - 1. Size: As indicated on Drawings.
 - 2. Substrate: As indicated on Drawings.
 - 3. Text and Font: As indicated on Drawings.

2.4 EXTERIOR METAL PIN-MOUNTED GRAPHICS

- A. Stainless Steel Plate, Sheet, and Strip: Type 304, complying with ASTM A 666.



- B. Cutout Characters: Characters with uniform faces; square-cut, smooth, eased edges; precisely formed lines and profiles. Comply with requirements indicated for finish, style and size.

2.5 BRANCH PLAQUE

- A. Etched Plaque: Chemically etched or photochemically engraved metal sheet or plate with texture, border, and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
 - 1. Plaque Material: Plate aluminum; ASTM B209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.
 - 2. Plaque Thickness: As indicated on Drawings.
 - 3. Finishes: As indicated on Drawings.
 - 4. Mounting: As indicated on Drawings.
 - 5. Text and Typeface: As indicated on Drawings.
 - a. Machine-engrave characters and other graphic devices into indicated plaque surface to produce precisely formed copy, incised to uniform depth.
 - b. Fill engraved graphics with manufacturer's standard baked enamel.
- B. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of plaques, noncorrosive and compatible with each material joined, and complying with the following:
 - 1. Use concealed fasteners and anchors unless indicated to be exposed.
 - 2. For exterior exposure, furnish nonferrous-metal, stainless-steel or hot-dip galvanized devices unless otherwise indicated.
 - 3. Exposed Metal-Fastener Components, General:
 - a. Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.
 - b. Fastener Heads: For nonstructural connections, use flathead or oval countersunk screws and bolts with tamper-resistant Allen-head, spanner-head or one-way-head slots unless otherwise indicated.
 - 4. Plaque Mounting Fasteners:
 - a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of plaque, screwed into back of plaque, or screwed into tapped lugs cast integrally into back of plaque unless otherwise indicated.
 - b. Through Fasteners: Exposed metal fasteners matching plaque finish, with type of head indicated, installed in predrilled holes.

2.6 DESK AND SHELF SIGNS

- A. Aluminum Sheet and Plate: ASTM B209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.



- B. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

2.7 MISCELLANEOUS SIGNAGE AND GRAPHICS

- A. Provide miscellaneous signage and graphics as shown and detailed on drawings.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. Install units and components at the locations directed by the Commissioner, securely mounted with concealed theft-resistant fasteners. Attach to substrates in accordance with the manufacturer's instructions.
- B. Install level, plumb, and at the proper height. Cooperate with other trades for installation of sign units to finish surfaces. Restore or replace damaged units as directed by the Commissioner.
- C. Dimensional Letters and Numbers: Mount letters and numbers using standard fastening methods recommended by the manufacturer for letter form, type of mounting, wall construction, and condition of exposure indicated and in accordance with approved shop drawings. Provide heavy paper template to establish letter spacing and to locate holes for fasteners. No visible adhesive shall be exposed or seep around letters.

END OF SECTION 10 14 00



SECTION 10 22 19 - DEMOUNTABLE 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. All glass partitions.
 - 2. Steel framed glazed partition system.
 - 3. Doors and frames in partition system.
 - 4. Finish hardware for doors.
- B. Related Sections
 - 1. Section 08 11 13 "Hollow Metal Doors and Frames"
 - 2. Section 08 71 00 "Door Hardware"
 - 3. Section 08 80 00 "Glazing"
 - 4. Section 09 21 16 "Gypsum Board Assemblies"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: Submit manufacturer's detailed materials and fabrication specifications and installation instructions. Include catalog cuts of hardware, fastenings and other data as required.
- C. Shop Drawings: Submit shop drawings for fabrication and erection of partition assemblies which are not fully described by manufacturer's data. Show anchorage and accessory items and finishes.
- D. Samples: Submit samples of each required finish and color. Prepare samples on same materials which will be used in partition assemblies.
- E. Provide signed and sealed calculations by a Professional Engineer licensed in the State of New York for the support of demountable partitions. Comply with the New York City Building Code.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".



- B. Manufacturer: Provide office partition system manufactured by a single firm specializing in production of this type of work.
- C. Shop Assembly: Preassemble items in shop to greatest extent possible. Disassemble units only to extent necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- D. Installed partitions shall have a deflection limit of $L/240$ when subject to a 5 psf uniform lateral load and a concentrated load of 200 lbs.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver demountable panel partition components cartoned or crated to provide protection during transit and job storage.
- B. Inspect partition components upon delivery for damage. Minor damages may be repaired, provided finish items are equal to new work and acceptable to Commissioner. Remove and replace damaged items as directed.
- C. Store partition components on raised platforms in vertical positions with blocking between units to allow air circulation. Keep stored material covered and protected from damage.

PART 2 PRODUCTS

2.1 ALL GLASS PARTITIONS

- A. System: Top and bottom channel frame as detailed, full height tempered glass glazing.
- B. Basis-of-Design Product - Top and Bottom Channels: Subject to compliance with requirements, provide C.R. Laurence Co., Inc.; 7/8" x 1 1/4" CRL "Wide Channel" or comparable product by one of the following:
 - 1. U.S. Aluminum
 - 2. MetroWall
 - 3. Or approved equal.
- C. Glass: Tempered glass; refer to Section 08 80 00 "Glazing."
- D. Silicone Sealant: As recommended by manufacturer.

2.2 STEEL FRAMED GLAZED PARTITION SYSTEM

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Inscape; Acme 50 or comparable product by one of the following:
 - 1. C.R. Laurence Co., Inc.
 - 2. Dorma USA, Inc.
 - 3. Or approved equal.



B. Materials

1. Metal: Steel, cold-rolled, annealed, stretcher-leveled furniture stock free of pits, scale, and other surface defects, conforming to ASTM A366, Type B, CS (commercial steel).
 - a. Posts shall be formed of 18 gauge steel.
 - b. Bases shall be formed of 18 gauge steel, independently removable for access to wiring raceways.
 - c. End fillers and closures shall be formed of 20 gauge steel and filled with 6 lb. density acoustic fiberglass insulation. Perimeter shall be sealed with Tremco Acoustic Sealant.
 - d. Panels shall be fabricated of 16 gauge steel.
 - e. Ceiling channel shall be fabricated of 18 gauge steel.
2. Glass and Glazing Accessories: Conform to the requirements of Section 08 80 00 "Glazing."
3. Doors and Frames: Conform to the requirements of Section 08 11 13 "Hollow Metal Doors and Frames."
4. Door Hardware: Conform to the requirements of Section 08 71 00 "Door Hardware."
5. Insulation: Inorganic, incombustible mineral wool filler for sound deadening.
6. Light and Sound Seals: Dense, compressible neoprene or other acceptable flexible, non-hardening gasket material.

C. Fabrication

1. Panels: Flush hollow unit construction, minimum 16 gauge steel facing sheets, smooth and free of buckles, oil canning, and seams. Provide stiffening members welded to inside surfaces of panel faces or provide gypsum board backing solidly laminated to entire back surface of panel. Enclose perimeter edges of each panel with metal.
 - a. Construct panels to interlock with adjoining panels or use internal vertical supports to ensure secure, rigid joints. Provide integral glazing recesses or other frame for glass at glazed openings. Insulate panels with inorganic mineral filler packed solidly for sound deadening.
2. Base: Provide recessed, steel channel, 18 gauge.
3. Ceiling Trim: Minimum 20 gauge steel continuous profile, adjustable to variations in ceiling level, securely fastened to ceiling, with light and sound seal at ceiling contact.
4. Field Joints: Provide concealed splice at field joints to ensure rigidity and alignment.
5. Electrical Cutouts: Provide cutouts in panels or base for electrical outlets shown on Electrical drawings.
6. Door Frames: 18 gauge minimum steel, vertically adjustable to suit floor irregularities, with continuous sound-deadening closure seals at jamb and head stops. Mortise and reinforce frames to retain required hardware and to stiffen frame. Drill and tap for machine screws for mortise hardware per templates furnished with hardware. Conform to the requirements of Section 08 11 13 "Hollow Metal Doors and Frames."



- a. Reinforce heads of frames to receive surface-mounted door closers whether or not such closures are indicated.
7. Telescoping Sliding Door System: Inscape standard top-mounted concealed (in ceiling) sliding track and concealed floor guide at sliding doors furnished and installed Inscape. Sliding mechanism shall be designed for 1/2" thick glass doors weighing up to 325 lbs, with four-wheel carrier, center hung for efficient operation. Vertical adjustment of 1/2". Heavy duty aluminum I-Beam track; jump proof design. Conforms to ANSI/BMHA standards, Grade 1. Adjacent telescoping doors shall be activated by bottom rail J-Hook beneath the door and cushioned with heavy-duty Inscape rubber bumpers. Installer shall engineer support above.
8. Offset Pivot Doors
 - a. Door No. 113: 1 3/4" Offset Pivot Flush Wood Door
 - b. Door Nos. 116, 118: 1 3/4" Offset Pivot Framed Glass Door with mortise lock box
9. Hardware: Install locks, door closers, door stops, thresholds, and other hardware furnished under the Section 08 71 00 "Door Hardware" for doors in demountable partitions. Install door bottoms and lock-reinforcing units at factory. Install other hardware at job site.
10. Furnish and install the following hardware:
 - a. Off set center hung pivot hardware.
 - b. Fasteners: Provide Phillips-head screws and bolts, nuts, washers, grommets, and other fastening devices of appropriate type, metal, and finish. Countersink screws and bolts.
 - c. Rockwood full height LP3301 series locking pull with bold down and dustproof strike.
11. Finishes: Steel to be shop finished with manufacturer's standard factory applied paint finish complying with ANSI A250.3; custom color and glass as selected by the Commissioner.
12. Glazing: Set glass in glazing strips for firm retention and tight seal and to permit easy removal and reinstallation without damage. Loose glazing stops and exposed screws are not acceptable.
13. Connectors and Accessories: Provide connectors, fasteners, and accessories required for rigid, secure, complete, and finished demountable metal partition system.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. Install partitions before floor coverings and after suspended drywall ceilings have been installed. Coordinate partition work with work of other trades which are affected by partition installation. Avoid damage to installed work.
- B. Repair damaged or defaced work or replace with new work, as acceptable to Commissioner. Completely refinish defaced partition components with factory finished materials, or replace defaced components.



- C. Furnish, drill for and install anchoring devices required, and secure partitions to floor, ceiling and walls, using concealed fasteners.
- D. Install partitions rigid, level, plumb and in alignment, with components secure together, in accordance with manufacturer's instructions.
- E. Provide through posts to ceiling, or other concealed supports as required to ensure lateral stability of partition runs.
- F. Install continuous and positive seal to prevent light and sound transmission at partition contacts with floor, ceiling, wall and other abutting surfaces.
- G. Adjust hardware and doors and leave in proper operating condition.

END OF SECTION 10 22 19



THIS PAGE INTENTIONALLY LEFT BLANK



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 toilet accessories.
- B. Related Sections
 - 1. Section 04 20 00 "Unit Masonry"
 - 2. Section 09 21 16 "Gypsum Board Assemblies"
 - 3. Section 09 30 13 "Ceramic Tiling"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: Submit manufacturer's technical data, catalog cuts and installation instructions for each toilet accessory.
- C. Setting Drawings: Provide setting drawings, templates, instructions, and directions for installation of anchorage devices in other work
- D. Submit schedule of accessories indicating quantity and location of each item.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry; coordinate delivery with other work to avoid delay.
- C. Accessory Locations: Coordinate accessory locations with other work to avoid interference and to ensure proper operation and servicing of accessory units. Accessories shall be installed at heights in compliance with prevailing Handicapped Code.
- D. Products: Unless otherwise noted, provide products of same manufacturer for each type of unit and for units exposed in same areas.



1.5 PRODUCT HANDLING

- A. Deliver accessories to the site ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type or material, manufacturer's name and brand name. Delivered materials shall be identical to approved samples.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22 gauge minimum, unless otherwise indicated.
- B. Brass: ASTM B 19 flat products; ASTM B 16, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.
- C. Galvanized Steel Sheet: ASTM A 653, G60.
- D. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B 456, Type SC 2.
- E. Mirrors: ASTM C 1503, mirror glazing quality, clear glass mirrors, nominal 1/4" thick.

2.2 FASTENING DEVICES

- A. Exposed Fasteners: Theft-proof type, chrome plated, or stainless steel; match finishes on which they are being used.
- B. Concealed Fasteners: Galvanized (ASTM A 123) or cadmium plated.
- C. No exposed fastening devices permitted on exposed frames.
- D. For metal stud drywall partitions, provide ten (10) gauge galvanized sheet concealed anchor plates for securing surface mounted accessories.

2.3 FABRICATION

- A. General: Stamped names or labels on exposed faces of toilet accessory units are not permitted. Unobtrusive labels on surfaces not exposed to view are acceptable. Where locks are required for a particular type of toilet accessory, provide same keying throughout project. Furnish two keys for each lock.
- B. Surface-Mounted Toilet Accessories, General: Fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage.
- C. Recessed Toilet Accessories, General: Fabricate units of all welded construction, without mitered corners. Hang doors of access panels with full-length stainless steel piano hinge. Provide anchorage that is fully concealed when unit is closed.

2.4 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:



1. Bobrick Washroom Equipment Co.
2. American Specialties, Inc.
3. Bradley Corp.
4. A & J Washroom Accessories
5. Georgia-Pacific
6. Elkay
7. Koala Kare
8. Or approved equal.

2.5 ACCESSORY SCHEDULE

- A. AC-SD1: Soap dispenser: Bobrick B-2111, stainless steel, satin finish or similar product by a manufacturer listed in 2.4, or approved equal.
- B. AC-HD1: Electric hand dryers: Bobrick B-7128 Trimline Series, wall mounted, stainless steel with plastic trim or similar product by a manufacturer listed in 2.4, or approved equal.
- C. AC-TPD1: Toilet paper dispenser: Bobrick B-2840, surface mounted w/ utility shelf, stainless steel, satin finish or similar product by a manufacturer listed in 2.4, or approved equal.
- D. AC-M1: Mirrors: Bobrick B-209 1836, wall mounted, satin finish stainless steel or similar product by a manufacturer listed in 2.4, or approved equal.
- E. AC-G3: Grab bars: Bobrick, B-6806X42, wall mounted, satin finish stainless steel or similar product by a manufacturer listed in 2.4, or approved equal.
- F. AC-G3: Grab bars: Bobrick, B-6806X36, wall mounted, satin finish stainless steel or similar product by a manufacturer listed in 2.4, or approved equal.
- G. BC-1: Baby changing station: Koala Kare KB110-SSWM, horizontal wall-mounted, stainless steel or similar product by a manufacturer listed in 2.4, or approved equal.
- H. AC-WR1: Waste Receptacle: Bobrick, B-2260, floor standing open top waste receptacle, satin finish stainless steel or similar product by a manufacturer listed in 2.4, or approved equal.
- I. AC-MH1: Mop & broom holder: Elkay LK403, Stainless steel or similar product by a manufacturer listed in 2.4, or approved equal.
- J. AC-H1: Robe hook: Bobrick, B-76717, satin finish stainless steel or similar product by a manufacturer listed in 2.4, or approved equal.



PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION

- A. Accessories that are to be partition mounted shall be closely coordinated with other trades, so that the necessary reinforcing is provided to receive the accessories.
- B. Furnish templates and setting drawings and anchor plates required for the proper installation of the accessories at gypsum drywall and masonry partitions. Coordinate the work to ensure that base plates and anchoring frames are in the proper position to secure the accessories.
- C. Verify by measurements taken at the job site those dimensions affecting the work. Bring field dimensions that are at variance with those on the approved shop drawings to the attention of the Commissioner. Obtain decision regarding corrective measures before the start of fabrication of items affected.

3.3 INSTALLATION

- A. Install accessories at locations indicated on the drawings, using skilled mechanics, in a plumb, level and secure manner.
- B. Concealed anchor assemblies for gypsum drywall partitions shall be securely anchored to metal studs to accommodate accessories. Assemblies shall consist of plates and/or angles tack welded to studs.
- C. Secure accessories in place, at their designated locations by means of theft-proof concealed set screws, so as to render removing of the accessory with a screwdriver impossible.
- D. Unless otherwise indicated, accessories shall conform to heights from the finished floor as shown on the drawings. Where locations are not indicated, such locations shall be as directed by the Commissioner.
- E. Installed accessories shall operate quietly and smoothly for use intended. Doors and operating hardware shall function without binding or unnecessary friction. Dispenser type accessories shall be keyed alike. Prior to final acceptance, master key and one duplicate key shall be given to the Commissioner.
- F. The Commissioner shall be the sole judge of workmanship. Workmanship shall be of the highest quality. Open joints, weld marks, poor connections, etc., will not be permitted. The Commissioner has the right to reject any accessory if the workmanship is below the standards of this project.
- G. Grab bars shall be installed so that they can support a three hundred (300) lb. load for five minutes per ASTM F 446.

END OF SECTION 10 28 13



SECTION 10 44 13 - FIRE PROTECTION 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 fire extinguisher cabinets.
- B. Related Sections
 - 1. Section 09 21 16 "Gypsum Board Assemblies"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: Submit manufacturer's technical data and installation instructions for fire extinguisher cabinets. Include roughing-in dimensions, and details showing mounting methods, relationships to surrounding construction, door hardware, cabinet type and materials, trim style and door construction, style and materials. Where color selections by the Commissioner are required, include color charts showing full range of manufacturer's standard colors and designs available.
- C. Samples: Submit samples, 6" square, of each required finish. Prepare samples on metal of same gauge as metal to be used in the work.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

PART 2 PRODUCTS

2.1 CABINETS

- A. Type and Style: Fire extinguisher cabinets shall be Type 304 stainless steel with No. 4 finish, recessed, with plexiglass panel, sized to fit within the partition or wall depth. Provide fire rated cabinets within fire rated partitions.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide Larsen's Mfg. Co.; Model G-2409-RT recessed, trimless, with Duo-Panel door or comparable product by one of the following:
 - 1. J. L. Industries
 - 2. Potter Roemer



3. Or approved equal.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. Install items included in this Section in locations indicated and at heights to comply with New York City Building Code.
 1. 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.
 2. Securely fasten fire extinguisher cabinets to structure, square and plumb, to comply with manufacturer's instructions.

3.3 IDENTIFICATION

- A. Identify fire extinguisher cabinet with lettering spelling "FIRE EXTINGUISHER" painted on door by silk-screen process. Provide lettering on door as selected by Commissioner from manufacturer's standard letter sizes, styles, colors and layouts.

END OF SECTION 10 44 13



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 roof mounted flagpoles / banners.
- B. Related Sections
 - 1. Section 07 52 13 "Atactic-Polypropylene-Modified Bituminous Membrane Roofing"
 - 2. Section 07 62 00 "Sheet Metal Flashing and Trim"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, operating characteristics, fittings, accessories, and finishes for flagpoles.
- C. Shop Drawings: For flagpoles, including plans, elevations, details, and attachments to other work. Show general arrangement, jointing, fittings, accessories, grounding, anchoring, and support. Include details of roof-mounted connections and mountings.
- D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- E. Engineering Services Submittal: For flagpoles. Include loads, point reactions, and locations for attachment of flagpoles to building's structure.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Manufacturing Standards: Provide each flagpole as a complete unit produced by a single manufacturer, including fittings, accessories, bases and anchorage devices.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products of one of the following:



1. American Flagpole; a Kearney-National Inc. company.
2. Concord Industries, Inc.
3. Morgan-Francis; Division of Original Tractor Cab Co., Inc.
4. Or approved equal.

2.2 PERFORMANCE REQUIREMENTS

- A. Engineering Services: Engage a Professional Engineer licensed in the State of New York to engineer flagpole assemblies.
- B. Structural Performance: Flagpole assemblies, including anchorages and supports, shall withstand design loads indicated within limits and under conditions indicated.
 1. Wind Loads: Determine according to NAAMM FP 1001. Basic wind speed for Project location is 90 mph.
 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 STEEL FLAGPOLES

- A. Steel Flagpoles: Provide custom-designed steel capped tube and banner support fabricated from tube or plate complying with the following:
 1. Steel Plates, Shapes, and Bars: ASTM A 36.
 2. Steel Tubing: ASTM A 500.
 3. Provide galvanized finish for exterior installations.
- B. Construct pole and ship to site in one piece, if possible. If more than one piece is necessary, provide snug-fitting, precision joints with self-aligning, internal splicing sleeve arrangement for weather-tight, hairline field joints.

2.4 MISCELLANEOUS MATERIALS

- A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M.

2.5 STEEL FINISHES

- A. High-Performance Organic Finish: Three-coat fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. 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 Commissioner.



PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. General: Install flagpoles where indicated and according to Shop Drawings and manufacturer's written instructions.
 - 1. Provide positive lightning ground for each flagpole installation.

END OF SECTION 10 75 00



**Department of
Design and
Construction**

FMS No. - LNCA13HAM

Issue Date - 04/15/2022

THIS PAGE INTENTIONALLY LEFT BLANK



SECTION 11 51 23 - LIBRARY STACK 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 cantilever bracket type metal library bookstacks.
- B. Related Sections
 - 1. Section 05 50 00 "Miscellaneous Metals"
 - 2. Section 06 40 23 "Architectural Woodwork"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Shop Drawings: Submit complete and accurate shop drawings for all work of this Section, showing at large scale the construction, framing, reinforcement, anchorage, connections to adjacent work and of the necessary and required details.
- C. Samples: 12" x 12" section of end panel with required finish.
- D. Verifying Conditions
 - 1. Verify all measurements in the field, as required, for work fabricated to fit conditions at the building.
 - 2. Before starting work, examine all adjoining work on which the work of this Section is in any way dependent for perfect workmanship and fit. Do such corrective work to adjoining work as may be necessary to make the work of this Section perfect in all respects.
- E. Submit seismic verification statement as noted in Article 1.3.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Manufacturer Qualifications: Manufacturer shall submit evidence of having not less than 3 years' experience in fabrication of book stack systems.
- C. Installation must be engineered to meet a Zone 2 seismic requirement. Submit a statement from a professional engineer licensed in the State of New York indicating compliance with the seismic code as it relates to this project.



PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Plumbness of Completed Shelving: 1/8" maximum deviation between level of bottom shelf and canopy top, measured on the edge of any upright in any direction.
- B. Resistance of Completed Shelving to Lateral Forces: 1/4" maximum deflection from vertical under a horizontal force of 100 lbs applied against any upright in any direction at a point 48" above the floor or raised floor.
- C. Deflection of Uprights under Load: Maximum deflection of upright in any direction with all shelves evenly spaced and all shelves on one side of the range evenly loaded at 50 lbs per lineal shelf foot shall not exceed 1.00" at top of upright. Permanent set after load is removed shall not be more than 1/8 of an inch.
- D. Shelf Loading and Deflection: Shelves shall support loads of 50 lbs per lineal shelf foot without deflection in excess of 3/16" and without permanent set after load is removed. All shelving components shall be free of burrs, sharp edges, projecting hardware and other defects which could present a hazard to books or people. All surfaces and edges shall be smooth and non-abrasive. Shelving components shall exhibit no dents, oil-canning, buckling, or other surface irregularities. Vertical adjustment interval for shelves shall be on 1" centers. Gaps between adjoining shelf end bracket assemblies shall not exceed 3/32 of an inch.

2.2 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Spacesaver; Cantilever Shelving or comparable product by one of the following:
 - 1. MJ Industries.
 - 2. Tennsco.
 - 3. Or approved equal.

2.3 MANUFACTURED COMPONENTS – CANTILEVER SHELVING

- A. Provide cantilever bracket type metal library bookstack as defined by the American Library Association and published in their library technology reports.
 - 1. Height: See Drawings.
 - 2. Width: See Drawings.
 - 3. Depth: See Drawings.
 - 4. Number of Openings: See Drawings.
- B. Shelf Adjustability
 - 1. Adjustable shelf assemblies shall be easily and readily adjustable by one person without tools or disassembly of the end brackets from the shelf base, and without affecting other shelves or the stability of the section or the range.



2. Partially loaded shelves shall be easily and readily adjustable by one person by being able to reposition one shelf's end bracket attaching hooks in the adjoining upper or lower upright slots. To be followed by repositioning the opposite shelf brackets attaching hooks, so as to easily be able to "walk" the shelf either up or down the column.
- C. Materials and Workmanship
1. Only the finest materials and quality of workmanship will be acceptable. Commercial grade or case-type shelving will not be considered. Sheet metal is to be furniture grade. Gauge thicknesses are U.S. standard with the following minimum requirements.
 - a. Welded frame upright – Min. 14-gauge furniture grade.
 - b. Tubular top spreader – Min. 14-gauge furniture grade.
 - c. Bottom channel spreader – Min. 16-gauge cold rolled steel.
 - d. Shelves – Min. 18-gauge cold rolled steel.
 - e. Shelf end brackets – Min. 16-gauge cold rolled steel.
 - f. Canopy tops – Min. 18-gauge cold rolled steel.
- D. Cantilever "Wall Columns"
1. Cantilever "Wall Columns" to mounted to rear wall of millwork enclosure.
 2. The welded vertical frame shall consist of 2 vertical upright columns constructed of min. 14- gauge steel. Upright column shall be 2" deep with a 1 1/4" face with 1/2" return flanges.
 3. The uprights are fully welded to a tubular top spreader and a channel bottom spreader. The uprights shall have shelf attachment slots on 1" increments the entire length of the upright. Slots shall be 5/8" x 1/4". Uprights shall include location indicators the entire length of upright on a minimum of 6" centers.
 4. The tubular top spreader shall be a minimum of 14-gauge steel tube 2 1/2" tall x 1" wide. The bottom spreader channel shall be a 16-gauge channel 1 3/4" tall x 1" wide with two 3/8"- 16 UNC weld nuts provided for optional levelers.
- E. Shelf End Brackets: Made of minimum 16-gauge steel of a depth not less than that of the shelf on which they are used and shall extend not less than 6" above the top surface of the shelf. The top and front edges shall be flanged outwardly to a half round profile to prevent accidental knifing of material. Shelf brackets shall have a minimum of two hooks at the top for engaging into the column (post) and one safety lug to prevent accidental dislodgment at the bottom. Outward embossment in the upper front corner of the shelf brackets shall act as shelf spacers and prevent overlapping of shelf end brackets. For aesthetic reasons as well as to prevent sharp corners, the upper front corner of the shelf brackets shall have a radius of not less than 1 inch. The base of the end brackets will have two lanced tabs that interlock with the shelf and provide firm support for the shelf. Lance tabs and shelf shall be provided with 1/4" diameter holes for optional bolting of components. The front edge of the end bracket shall have a 15-degree slope.
- F. Base Shelves: No base shelf required. A standard shelf is to serve as the bottom shelf, to be set at the lowest point so that it sits directly on top of the bottom of the millwork enclosure. Shelves shall be formed from minimum 18 gauge cold rolled steel with a triple 90-degree bend on the rear of shelf and a double bend with a 3" surface at the front. Shelf ends to be turned down 90 degrees to engage and interlock into the shelf end brackets. Base shelves on mobile shall be 3/4" to sit flush with top of carriage profile. Base shelves shall be



individual on both faces of double face or single face units, with center filler channels. Each base shelf shall be supported by shelf brackets for maximum strength and support.

G. Plain Shelves

1. Shelves shall be formed from minimum 18 gauge cold rolled steel with a triple 90-degree bend on both front and rear edges with a shelf thickness to be 3/4". Shelf ends to be turned down 90 degrees to engage and interlock into the shelf end brackets. Shelves shall be no less than 1/4" from actual dimension specified.
2. All parts of identical dimensions shall be totally interchangeable without modification.

2.4 GENERAL FINISH REQUIREMENTS

- A. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. 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.
- B. Bending: Finish must show no adverse effects, other than cracks at either end of the test panel no greater than 1/4" when bent around 180 degrees at 1/4" mandrel in one second. This test must be performed with the grain of the steel parallel and transverse to the mandrel (modification of Federal Test Standard No. 141a. Method 6221).
- C. Impact: Finish must show no cracks or chipping when a 2" diameter steel ball is dropped 10-1/2" onto a painted test panel laid over a 1-1/4" diameter opening.
- D. Resistance of the Finish to Abrasion: Finish must resist falling sand abrasion test in accordance to ASTM method 968-51. The minimum number of liters of sand needed to expose a 5/32" area of substratum should be 30.
- E. Resistance of the Finish to Acids and Chemicals: Finish must be capable of withstanding exposure to 95% solution of alcohol, 10% solution of acetic acid, machine oil, and undiluted household ammonia for 30 minutes and a 10% solution of lye for 15 minutes and show no signs of discoloration, softening or blemishes.

2.5 STEEL FINISHES

- A. All components shall be painted with powder coat paint that meets or exceeds specifications set forth by the American Library Association for Cantilever Bracket Type Metal Library Bookstacks published in their Library Technology Reports.
- B. Powder-Coat Finish: Manufacturer's standard two-coat, baked-on finish, consisting of prime coat and thermosetting topcoat to achieve a minimum dry film thickness of 2 mils.
 1. Color and Gloss: As indicated by manufacturer's designations.



PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. Coordinate as required with other trades to ensure proper and adequate provision in the work of those trades for interface with the work of this Section.
- B. Install the work of this Section in strict accordance with the original design, the approved shop drawings and the manufacturer's recommended installation procedures, anchoring all components firmly into position for long life under hard use.

END OF SECTION 11 51 23



**Department of
Design and
Construction**

FMS No. - LNCA13HAM
Issue Date - 04/15/2022

THIS PAGE INTENTIONALLY LEFT BLANK



SECTION 11 52 13 - ELECTRICALLY OPERATED PROJECTION SCREENS

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: Electrically operated front projection screens and accessories.
- B. Related Sections:
 - 1. Section 26 05 00 - Common Work Results for Electrical: Power supply, conduit and wiring.

1.3 DEFINITIONS

- A. Gain: Indication of screen's luminance or brightness, measured perpendicular to screen center and relative to magnesium carbonate block, which serves as standard for 1.0 gain. Higher numbers indicate greater brightness.
- B. Viewing Angle: Horizontal angle from perpendicular center of screen at which gain or brightness decreases by 50%.
- C. Format: Proportion of projection screen viewing area expressed as a ratio of width/height.
 - 1. HDTV Format: 1.78:1.

1.4 REFERENCES

- A. International Code Council (ICC):
 - 1. International Building Code.
- B. Society of Motion Picture and Television Engineers (SMPTE):
 - 1. SMPTE RP 94-2000, Gain Determination of Front Projection Screens.
- C. Underwriters Laboratories Inc. (UL).

1.5 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures."
- B. Product Data: Submit product data, including manufacturer's technical product data sheet, for specified products.
 - 1. Material Safety Data Sheets (MSDS).



- C. Shop Drawings: Indicate dimensions, fabrication and installation details.
 - 1. Include electric wiring diagrams.
- D. Samples: Submit 2 samples of screen finish material having dimensions of 6 inches × 6 inches (152 × 152 mm).

1.6 INFORMATION SUBMITTALS

- A. Quality Assurance:
 - 1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
 - 2. Certificates: Product certificates signed by manufacturer certifying that materials comply with specified performance characteristics, criteria and physical requirements.
 - 3. Manufacturer's installation instructions.

1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data
 - 1. Manufacturer's instructions detailing maintenance requirements.
 - 2. Parts catalog that includes complete list of repair and replacement parts, with cuts and identifying numbers.

1.8 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."
- B. Qualifications: Worker experienced in performing work of this section who has specialized in work similar to that required of this project.
- C. Regulatory Requirements: Comply with 1968 New York City Building Code.
- D. Preinstallation Meetings: Conduct preinstallation meeting to verify project requirements and manufacturer's instructions.

1.9 DELIVERY, STORAGE & HANDLING

- A. Storage and Protection:
 - 1. Store electric projection screens in a dry, ventilated area, protected from exposure to harmful weather conditions, at a temperature less than 80 degrees F (27 degrees C).
- B. Handling: Handle electrically operated projection screen materials with care in order to prevent damage.
- C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- D. Waste Management and Disposal:
 - 1. Remove packaging materials from site and dispose of at appropriate recycling facilities.



1.10 PROJECT AMBIENT CONDITIONS

- A. Project Location: Perform electrically operated projection screen work when temperatures are greater than 40 degrees F (4 degrees C).

1.11 SEQUENCING

- A. Sequence With Work of Other Trades: Comply with projection screen manufacturer's written recommendations for sequencing construction operations.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Subject to compliance with requirements, provide Da-Lite Screen or comparable product by one of the following:
 - 1. Draper, Inc.
 - 2. Stewart Filmscreen Corporation
 - 3. Or approved equal.

2.2 PROJECTION SCREEN SYSTEMS

- A. Wall Mounted Electrically Operated Projection Screen Systems.
 - 1. Screen Operation: Electrically operated, UL and ULC listed, retractable, with rigid metal roller and tab guide cable screen tensioning system.
 - 2. Motor: Housed inside metal roller. Includes automatic thermal overload protection, integral gears, capacitor and electric brake to prevent coasting, and preset, adjustable limit switches to automatically stop viewing surface in the UP or DOWN positions.
 - a. Type: 3-wire, permanently lubricated, reversal type designed for mounting inside roller and to suit project requirements.
 - b. Voltage, Frequency: 115 V, 60 Hz.
 - c. Amperage: 2.4 amps maximum.
 - 3. Electric Controls: Wall mounted switch with integral junction box incorporated into screen housing.
 - a. Voltage, Frequency: 115 V, 60 Hz.
 - b. Switch: 3 position type with cover plate for UP, DOWN and STOP functions.
 - 4. Screen Mounting: Wall.
 - a. Include mounting hardware and roller mounting brackets that adjust to allow centering or offsetting of the screen within the case.
 - 5. Screen Case: Designed to receive mounting hardware and sized to suit projection screen.



- a. Material: 21-gauge steel.
- b. Design: 2-piece with curved contour flat-backed style with heavy-duty end caps concealing roller ends.
- c. Length: 137 inches (3480 mm).
- d. Finish:
 - 1) Case Front: Powder coated white.
- 6. Screen Size:
 - a. Viewing Area: 65 inches H × 116 inches W (1650 × 2946 mm).
 - b. Overall Dimensions: 80.5 inches H × 127.5 inches W (2044 × 3239 mm).
- 7. Material
 - a. Tab Guide Cable Tensioned Screen Material:
 - 1) Front projection, flame retardant, mildew resistant vinyl, with black backing and with standard black borders, easily cleaned with mild soap and water solution.
 - 2) Include tab and cable guide on each side of fabric to maintain even, lateral tension and hold viewing surface flat.
 - 3) Bottom end of fabric to be inserted into a custom aluminum slat bar with added weight to provide vertical tension on the screen surface.
 - 4) Slat ends to be protected by heavy-duty plastic caps enclosing a preset adjustable mechanism for screen tensioning.
 - 5) Seamless in all sizes.
 - b. Gain: To SMPTE RP 94-2000, 1.0.
 - c. Viewing Angle: 60
 - d. Format: HDTV - 1.78:1.
 - e. Acceptable Viewing Surface:
 - 1) Da-Lite Screen Company, Inc.: Da-Mat
 - 2) Draper Inc.: OptiFlex Matt White XT1000VB
 - 3) Stewart Filmscreen: StudioTek 100
 - 4) Or approved equal.

2.3 ACCESSORIES

- A. Screen Drop: Extra drop of 12 inches (25 mm) in black fabric at top, not to exceed 14 feet (4.3 m) maximum total surface height, including picture area.
- B. Low Voltage Control (LVC) System:
 - 1. Single Motor Low Voltage Control (LVC) System: Internal.



- C. Silent Motor with Integrated Low Voltage Control System (LVC).
- D. Installation Hardware: Fasteners and other components of type, size and spacing recommended by manufacturer for complete, functional and secure installation of electric screen.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements

3.2 EXAMINATION

- A. Site Verification of Conditions:
 - 1. Verify that conditions of substrates previously installed under other sections or contracts are acceptable with electrically operated projection screen installation.
 - 2. Ensure electrical power supply is installed to meet electric projection screen requirements in accordance with Section 26 05 00 - Common Work Results for Electrical.
 - a. Verify type and location of power supply.
 - 3. Inform of unacceptable conditions immediately upon discovery.
 - 4. Proceed with installation only after unacceptable conditions have been corrected.

3.3 COORDINATION

- A. Coordinate electric projection screen placement with placement of other ceiling and wall mounted components.

3.4 INSTALLATION

- A. Install electric projection screens in accordance with reviewed shop drawings at locations and heights indicated.
- B. Install screen housing and make electrical connections prior to installation of ceiling system.
 - 1. Verify locations prior to installation.
- C. Securely install screens plumb and level to supporting substrate.

3.5 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services: Have manufacturer's technical representative schedule site visits to review work as follows:
 - 1. After delivery and storage of products.
 - 2. When preparatory work for which work of this Section depends on is complete, but before installation begins.
 - 3. 2 times during progress of work at 25% and 60% of completion.
 - 4. Upon completion of work, after cleaning is carried out.
- B. Testing and Inspection: Operate each screen 3 times to ensure viewing surfaces extend and



retract through full range of motion.

1. Verify controls, limit switches, and other components function as designed and meet project requirements.
2. Ensure viewing surface raising operation fully engages and lifts screen closure door into closed position.
3. Adjust motors, controls and components to allow for smooth, unobstructed screen operation.

3.6 FINAL CLEANING

- A. Upon completion, remove surplus materials, rubbish, tools and equipment.

3.7 PROTECTION

- A. Repair damage to adjacent materials caused by electrically operated projection screen work.

END OF SECTION 11 52 13



SECTION 12 22 00 - CURTAINS AND DRAPES

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. Drapes.
 - 2. Drapery tracks.

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: For the following:
 - 1. Drapery Tracks: Include maximum weights of drapes that can be supported.
 - 2. Fabrics.
 - 3. Textile treatments.
- C. Shop Drawings:
 - 1. Drapery Tracks: Show installation and anchorage details and locations of controls.
 - 2. Drapes: Show sizes, locations, and details of installation.
- D. Samples: As follows:
 - 1. Drapery Tracks: 18 inches long, with carriers, controls, and accessories.
 - 2. Drapery Fabrics: For each color and pattern indicated, full width by 36 inches long, from dye lot to be used for the Work and with specified textile treatments applied. Show complete pattern repeat if any. Mark top and face of fabric.
 - 3. Textile Trims: For each color and pattern indicated, 18 inches long.
 - 4. Drape Fabrication: For each heading, fabric, color, and pattern indicated, a complete full-size panel to verify details of fabrication and thread colors.
- E. Samples for Initial Selection: For each type of product indicated.



F. Samples for Verification: As follows:

1. Drapery Tracks: 18 inches long, with carriers, controls, and accessories.
2. Drapery Fabrics: For each color and pattern indicated, full width by 36 inches long, from dye lot to be used for the Work and with specified textile treatments applied. Show complete pattern repeat if any. Mark top and face of fabric.
3. Textile Trims: For each color and pattern indicated, 18 inches long.
4. Drape Fabrication: For each heading, fabric, color, and pattern indicated, a complete full-size panel to verify details of fabrication and thread colors.

G. Product Schedule: For drapes and drapery tracks. Use same designations indicated on Drawings.

H. Coordination Drawings: For drapery track installation; reflected ceiling plans drawn to scale and coordinating track installation with openings and ceiling-mounted items, on which the following items are shown:

1. Suspended ceiling components.

I. Product Certificates: For each drapery fabric treated with flame retardant, signed by fabric supplier and indicating treatment durability and cleaning procedures required to maintain treatment effectiveness.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Provide complete assemblies produced by one manufacturer, including hardware, accessory items, mounting brackets, and fastenings.
- C. Provide materials in colors as selected by the Commissioner from manufacturer's standard colors.

1.5 WARRANTY

- A. Manufacturer's standard non-depreciating 25-year limited warranty covering all hardware.

PART 2 PRODUCTS

2.1 DRAPERY TRACKS

- A. Manually Operated Track: Basis of Design Curtain track: Rose Brand Trak-Eze 220 series rack system, soffit-mounted or approved equal by one of the following:
 1. I. Weiss
 2. Recmar
 3. Or approved equal.



- B. Construction: Extruded aluminum, slotted for mounting at interval of not more than 24 inches o.c. and bendable to radii indicated.
 - 1. Lengths and Configurations: As indicated on Drawings.
 - 2. Support Capability: Weight of drapery indicated mounted on track length indicated.
 - 3. Finish: As selected by the Commissioner.
- C. Mounting Brackets: Aluminum, of type suitable for fastening track to surface indicated and designed to support weight of track assembly and drapery plus force applied to operate track.
 - 1. Mounting Surface: As indicated on Drawings.
 - 2. Size: As indicated on Drawings.
- D. Installation Fasteners: Sized to support track assembly and drapery, and fabricated from metal compatible with track, brackets, and supporting construction. Provide two fasteners to fasten each bracket to supporting construction.
- E. Operation: Baton
- F. Carriers: Rollers with hooks
- G. End Stops: Manufacturer's standard with track end cap.

2.2 DRAPES

- A. Curtain fabric: As a Basis of Design, Rose Brand 20 oz. Crescent velour, medium weight, matte, 99% opaque approved equal by one of the following:
 - 1. Drapery Industries
 - 2. Kirsch
 - 3. Or approved equal.
- B. Source Limitations: Obtain each color and pattern of drapery fabric and trim from one dye lot.
- C. Fire-Test-Response Characteristics: For fabrics treated with fire retardants, provide products that pass NFPA 701 as determined by testing of fabrics that were treated using treatment-application method intended for use for this Project by a qualified testing and inspecting agency.
- D. Orientation: Run right.
- E. Width: 54".
- F. Textile Treatments: Stain repellent
- G. Lining Fabric:
 - 1. Lining Type: Water resistant.



2. Product: Selected by fabricator for use with drapery fabric indicated.
3. Color: to match drape.

H. Hem Weights: 1-inch square lead weights.

2.3 DRAPE FABRICATION

- A. Fabricate drapes in heading styles and fullnesses indicated. Fabricate headings to stand erect. If less than a full width of fabric is required to produce panel of specified fullness, use equal widths of not less than one-half width of fabric located at ends of panel.
 1. One-Way-Stacking Drapes: Add 5 inches to overall width for returns.
 2. Center-Opening Drapes: Add 10 inches to overall width for overlap.
- B. Seams: Sew vertical seams with twin-needle sewing machine with selvage trimmed and overlocked. Join widths so that patterns match and vertical seams lay flat and straight without puckering. Horizontal seams are unacceptable.
- C. Side Hems: Double-turned, 1-1/2-inch wide hems consisting of three layers of fabric, and blindstitched so that stitches are invisible on face of drape.
- D. Bottom Hems: Double-turned, 4-inch wide hems consisting of three layers of fabric, and weighted and blindstitched so that weights and stitches are invisible on face of drape.
 1. Sew in square lead weights at each seam and at panel corners.
- E. Interlinings: Extend from top of drape to within 1/2 inch of lining's bottom hem and to leading edge of side hems to produce full-shadowed appearance.
- F. Linings: Equal to widths of drapery fabric and joined to drapery fabric at top by inside invisible seam, and hand stitched at side hems and shadowed with 1-1/2-inch return of face fabric.
 1. Bottom Hem: Blind stitch to drapery fabric.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 DRAPERY TRACK INSTALLATION

- A. Install track systems according to manufacturer's written instructions, level and plumb, and at height and location in relation to adjoining openings as indicated on Drawings.
- B. Isolate metal parts of tracks and brackets from concrete, masonry, and mortar to prevent galvanic action. Use tape or another method recommended in writing by track manufacturer.



3.3 DRAPE INSTALLATION

- A. Where drapes abut overhead construction, hang drapes so that clearance between headings and overhead construction is 1/4 inch.
- B. Where drapes extend to floor, install so that bottom hems clear finished floor by not more than 1 inch and not less than 1/2 inch.
- C. Where drapes extend to windowsill, install so that bottom hems hang above sill line and clear sill line by not more than 1/2 inch.

3.4 ADJUSTING

- A. After hanging drapes, test and adjust each drapery track to produce unencumbered, smooth operation.
- B. Steam and dress down drapes as required to produce crease- and wrinkle-free installation.
- C. Remove and replace drapes that are stained or soiled.

END OF SECTION 12 22 00



THIS PAGE INTENTIONALLY LEFT BLANK



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. Section includes:
 - 1. Manually-operated window shades.
 - 2. Electrically operated window shades (Solar and Black-out).
 - 3. Field measurements of as-built conditions.
 - 4. Accessories and hardware required for complete installation and operation.

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. 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.
 - 1. Motorized Shade Operators: Include operating instructions.
 - 2. Motors: Show nameplate data, ratings, characteristics, and mounting arrangements.
- C. Shop Drawings: Submit floor layout and elevations, indicating location of all window treatments, mechanism details, type and size of each unit, type and location of controls. Shop drawings must also show seaming of shade fabric. Submit shop drawings showing details of installation and relation to adjoining construction and conditions.
- D. Samples: Submit full size sample of each shade type for Commissioner's acceptance.
- E. Mock-Up
 - 1. Install each type of shade assembly on one complete column bay for Commissioner's acceptance of installation details, workmanship and operation.
 - 2. Approved mock-up shall be used as the standard for installation of work under this Section, and no further installation work shall proceed before Commissioner's acceptance of the mock-up.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".



- B. Provide assemblies which are complete assemblies produced by one manufacturer, including hardware, accessory items, mounting brackets, and fastenings.
- C. Provide materials in colors as selected by the Commissioner from manufacturer's standard colors.

1.5 WARRANTY

- A. Manufacturer's standard non-depreciating 25-year limited warranty covering all hardware, chains, motors, motor control system and shade cloth.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Protect shades from damage, soiling and deterioration during transit, storage and handling to, until City of New York's acceptance.

PART 2 PRODUCTS

2.1 MANUALLY OPERATED SHADES

- A. Provide manually operated shade system equal to "Mechoshade/5 System," made by the Mecho-Shade Corp. or equal by SWF Contract, Hunter Douglas, Lutron or approved equal conforming to standards specified herein.
- B. Shade system shall be pre-engineered overrunning clutch design that disengages to 90% during the raising and lowering of the shade. The brake can stand a pull force of 40 lb. in the stop position. Requires no adjustment. Self-lubricating hub on to which the brake system is mounted includes an articulated brake assembly which ensures smooth, non-jerky operation in raising and lowering the shades. System shall include the following components:
 - 1. Provide shade hardware allowing for the removal of shade roller tube from brackets without removing hardware from opening and without requiring end or center supports to be removed.
 - 2. Provide shade hardware that allows for removal and remounting of the shade bands without having to remove the shade tube, drive or operating support brackets.
 - 3. Provide for universal, regular and offset drive capacity, allowing drive chain to fall at front, rear or non-offset for all shade drive end brackets. Universal offset shall be adjustable for future change.
 - 4. Provide shade hardware system that allows for removable regular and/or reverse roll fascias to be mounted continuously across two or more shade bands without requiring exposed fasteners of any kind.
 - 5. Provide shade hardware system that allows for operation of multiple shade bands (multi-banded shades) by a single chain operator. Connectors shall be offset to ensure alignment from the first to the last shade band.
 - 6. Provide shade hardware constructed of minimum 1/8" thick plated steel or heavier as required to support 150% of the full weight of each shade.
 - 7. Drive Bracket/ Brake Assembly:
 - a. MechoShade Drive Bracket M5 or similar product by a manufacturer listed in 2.1A or approved equal.



- b. Drive Chain: #10 qualified stainless steel chain rated to 90 lb.
 - c. Minimum Breaking Strength: Nickel plate chain shall not be accepted.
- C. Shade Bands: Construction of shade band includes the fabric, the hem weight, hem pocket, shade roller tube, and the attachment of the shade band to the roller tube. Sewn hems and open hem pockets are not acceptable.
 - 1. Hem Pockets and Hem Weights: Fabric hem pocket with RF welded seams (including welded ends) and concealed hem weights. Hem weights shall be of appropriate size and weight for shade band. Hem weight shall be continuous inside a sealed hem pocket. Hem pocket construction and hem weights shall be the same, for all shades within one room.
 - 2. Shade Band and Shade Roller Attachment:
 - a. Provide extruded aluminum shade roller tube of a diameter and wall thickness required to support shade fabric without deflection. Provide for positive mechanical engagement with drive/ brake mechanism.
 - b. Provide for positive mechanical attachment of shade band to roller tube; shade band shall be made removable/ replaceable with a snap-on/snap-off spline mounting, without having to remove shade roller from shade brackets.
 - c. Mounting spline shall not require use of adhesives, adhesive tapes, staples and/or rivets.

2.2 ELECTRICALLY OPERATED SHADES

- A. Provide electrically operated shade system equal to "Electro-Shade" made by the Mecho-Shade Corp. or equal by SWF Contract, Hunter Douglas, Lutron or approved equal conforming to standards specified herein.
- B. Access and Material Requirements:
 - 1. Provide shade hardware allowing for the removal of shade roller tube from brackets without removing hardware from opening and without requiring end or center supports to be removed.
 - 2. Provide shade hardware that allows for removal and remounting of the shade bands without having to remove the shade tube, drive or operating support brackets.
- C. Motorized Shade Hardware and Shade Brackets:
 - 1. Provide shade hardware constructed of minimum 1/8" thick plated steel, or heavier, thicker, as required to support 150% of the full weight of each shade. Plastic components without use of steel angle construction do not meet the intent of this specification and shall not be accepted.
 - 2. Provide shade hardware system that allows for field adjustment of motor or replacement of any operable hardware component without requiring removal of brackets, regardless of mounting position (inside, or outside mount).
 - 3. Provide shade hardware system that allows for operation of multiple shade bands offset by a maximum of 8-45 degrees from the motor axis between shade bands (4-22.5 degrees) on each side of the radial line, by a single shade motor.
 - a. Provide one shade band per window unit up to six shade band units per motor.
 - b. All shade bands within a single motor group shall be aligned within 1/4".



D. Shade Motors:

1. Intelligent Encoded Motor and Control system: tubular, asynchronous (non-synchronous) motors, with built-in reversible capacitor operating at 110v AC (60 Hz), single phase, temperature Class A, thermally protected, totally enclosed, maintenance free with line voltage power supply equipped with locking disconnect plug assembly furnished with each motor.
2. Conceal motors inside shade roller tube.
3. Maximum current draw for each shade motor of 2.3 amps.
4. Use motors rated at the same nominal speed for all shades in the same room
5. Wall Switches:
 - a. Where noted shades shall be operated by a 4 and 8 button low voltage programmable intelligent switches (IS). Standard switch shall be wired to a bus interface and the bus interface will be programmed to transmit an address for the local switch.
 - b. Intelligent switches may be installed anywhere on the bus line. Each IS shall be capable of storing one control level address to be broadcast along the bus line.
 - c. An address that is transmitted by either a switch or central controller shall be responded to by those motors with the same address in their control table.
 - d. IS shall provide for interface with other low voltage input devices via a set of dry contact terminals located on the switch.
 - e. Standard switch or IS may control an individual, sub-group or group of motors in accordance with the address in each motor.

2.3 SHADE CLOTH

- A. Solar Shade Cloth: Shade cloth shall be "Eco-Veil" group, 1350 Series of weave, color and optical properties as selected by the Commissioner made by MechoShade, or equal by SWF Contract, Hunter Douglas, Lutron or approved equal.
- B. Black-Out Shades: Where indicated, shade cloth shall be "Equinox 0100 Series" opaque acrylic black-out shade cloth made by MechoShade, or equal by SWF Contract, Hunter Douglas, Lutron or approved equal; color selected by the Commissioner.

2.4 ACCESSORIES

- A. Wall mounted bracket for solar shades.
- B. Recessed pocket with blackout channels at the Classrooms. Channels shall be extruded aluminum, with a black anodized finish.
- C. Hem Pockets and Hem Weights: Fabric hem pocket with RF welded seams (including welded ends) and concealed hem weights. Hem weights shall be of appropriate size and weight for shade band. Hem weight shall be continuous inside of sealed hem pocket.



2.5 FABRICATION

- A. The shade and the fabric shall hang flat without buckling or distortion. The edge, when trimmed, shall hang straight without curling or raveling. An unguided roller shade cloth shall roll true and straight, without shifting sideways more than +/- 1/8" in either direction due to warp distortion or weave design. Shades shall fill window openings from head to sill and jamb to jamb.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION - GENERAL

- A. Coordinate with the work of other trades to ensure proper and adequate provision in the work of those trades for interface with the work of this Section.
- B. Install the work of this Section in strict accordance with the indicated design and the installation recommendations of the manufacturer as approved by the Commissioner.
- C. Upon completion of the installation, put all components through at least ten (10) complete cycles of operation, adjusting as necessary to achieve optimum operation.

3.3 INSTALLATION OF MANUAL ROLLER SHADES

- A. Install roller shades level, plumb, square, and true according to manufacturer's written instructions and located so shade band is not closer than 2" to interior face of glass. Allow proper clearances for window operation hardware.
- B. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 INSTALLATION OF MOTOR OPERATED SHADES

- A. Install roller shades level, plumb, square, and true according to manufacturer's written instructions and located so shade band is not closer than 2" to interior face of glass. Allow proper clearances for window operation hardware.
- B. To control the responsibility for performance of motorized roller shade systems, the Contractor shall assign the engineering, and installation of motorized roller shade systems, motors, controls, and low voltage electrical control wiring specified in this Section to a single manufacturer and his authorized installer/dealer. The Commissioner will not produce a set of electrical drawings for the installation of control wiring for the motors, or motor controllers of the motorized roller shades. Power wiring (line voltage), shall be provided by the roller shade installer/dealer, in accordance with the requirements provided by the manufacture. Coordinate the following with the roller shade installer/dealer:
 - 1. Contractor shall provide power panels and circuits of sufficient size to accommodate roller shade manufacturer's requirements, as indicated on the mechanical and electrical drawings.
 - 2. Contractor shall coordinate with requirements of roller shade installer/dealer, before inaccessible areas are constructed.



3. Roller shade installer/dealer shall run line voltage as dedicated home runs (of sufficient quantity, in sufficient capacity as required) terminating in junction boxes in locations designated by roller shade dealer.
 4. Roller shade installer/dealer shall provide and run all line voltage (from the terminating points) to the motor controllers, wire all roller shade motors to the motor controllers, and provide and run low voltage control wiring from motor controllers to switch/control locations designated by the Commissioner. All above ceiling and concealed wiring shall be plenum rated, or installed in conduit, as required by the New York City Building Code.
 5. Contractor shall provide conduit with pull wire in all areas, which might not be accessible to roller shade contractor due to building design, equipment location or schedule.
- C. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

END OF SECTION 12 24 13



SECTION 12 48 13 - ENTRANCE FLOOR MATS 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 entrance floor mats and frames.

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: Submit manufacturer's specifications and installation instructions for entrance floor mats and frames. Include methods of installation for each type of substrate.
- C. Samples: Submit samples for each type and color of exposed entrance floor mat, frame and accessory required. Provide 12" square samples of floor mat, including frame.
- D. Maintenance Data: Submit manufacturer's printed instructions for cleaning, drying, maintaining and rehandling of removable entrance floor mat units.

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Manufacturer: Except as otherwise indicated, provide entrance floor mats and accessories by a single manufacturer for entire project.

1.5 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during, and after installation, and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

PART 2 PRODUCTS

2.1 MAT ASSEMBLY

- A. Mat: Provide 3/8" thick vinyl-backed Decorib / Tough Rib entrance mat in one piece, by Mats Inc., or equal by US Mat & Rubber Corp., Musson Rubber Co., or approved equal.
 - 1. Color: Grey #51.



2. Mats shall meet DOC Flammability Spec. (DOC-1-FF1-70) and shall not generate static electricity. Mats shall be natural fibers fused into a vinyl backing, classified as a "B" rating under Test ASTM E 84.

B. Frame

1. Framing members for recessed mats shall be angle type of extruded aluminum, ASTM B 221, Alloy 6061-T6, with a clear anodized finish.
2. Framing members shall be shop fabricated as an assembled unit and shall be provided with hairline joints, equally spaced, complete with corner pin, splice plates and installation anchors.
3. Surfaces in contact with concrete shall have a shop coating of clear acrylic.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. Install angle mat frames into prepared block out. Install mat frames in accordance with the manufacturer's installation instructions. Locate, align and level frame members accurately.
- B. Protection: Upon completion of frame installations and concrete work, provide temporary filler of plywood or fiberboard in mat recesses, and cover frames with plywood protective flooring. Maintain protection until construction traffic has ended and project reaches substantial completion.
- C. Delay installation of mats until work on the project reaches substantial completion.
- D. Lay mats in frames to fit properly and be centered in the recess; do not adhere.

END OF SECTION 12 48 13

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.

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 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.

1.5 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 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 PERFORMANCE AND SUBMITTALS

- A. Welding certificates.

PART 2 - PRODUCTS

2.1 PIPE, TUBE, AND FITTINGS

- A. Refer to individual Division 22 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 22 piping Sections 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. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
- D. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- E. Brazing Filler Metals: AWS A5.8, BCuP Series or BAg1, unless otherwise indicated.
- F. Welding Filler Metals: Comply with AWS D10.12.
- G. Solvent Cements for Joining Plastic Piping:
 - 1. ABS Piping: ASTM D 2235.
 - 2. CPVC Piping: ASTM F 493.
 - 3. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
 - 4. PVC to ABS Piping Transition: ASTM D 3138.

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, nonshrink and nonmetallic, dry hydraulic-cement grout.
 - 1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
 - 2. Design Mix: 5000-psi (34.5-MPa), 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 PLUMBING DEMOLITION

- A. Refer to Division 02 Section 024119 "Selective Demolition" for general demolition requirements and procedures.
- B. Disconnect, demolish, and remove plumbing systems, equipment, and components indicated to be removed.
 - 1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - 2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
 - 3. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - 4. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - 5. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Commissioner.
- C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.3 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. Install piping according to the following requirements and Division 22 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 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. Refer to Division 07 Section 078400 "Firestopping" for materials.
- Q. Verify final equipment locations for roughing-in.

- R. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

3.4 PIPING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 22 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. 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. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
- H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.5 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.

3.6 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.

3.7 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 (20.7-MPa), 28-day compressive-strength concrete and reinforcement as specified in Division 03 Section 033300 "Architectural Concrete."

3.8 ERECTION OF METAL SUPPORTS AND ANCHORAGES

- A. Refer to Division 05 Section 055000 "Metal Fabrications" for structural steel.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor plumbing materials and equipment.
- C. Field Welding: Comply with AWS D1.1.

3.9 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor plumbing 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.

3.10 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



THIS PAGE INTENTIONALLY LEFT BLANK

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. Division 22 Section 221119 "Domestic Water Piping Specialties".
2. Division 22 Section 221319 "Sanitary Waste Piping Specialties"
3. Division 22 Section 221423 "Storm Drainage Piping Specialties"
4. Division 22 Section 220553 "Identification for Plumbing Piping and Equipment" for valve tags and schedules.

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: For each type of valve indicated.

1.4 LEAD-FREE CERTIFICATION

- A. All products to be used in Domestic Hot and Cold Water systems must have "LEAD-FREE" certification.

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.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

- A. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- B. Valve Sizes: Same as upstream piping unless otherwise indicated.
- C. 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. Handlever: 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.
- D. 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.
- E. 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 manufacturers:
 - 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 (1035 kPa).
 - c. CWP Rating: 600 psig (4140 kPa).
 - 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 manufacturers:
 - 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 (1380 kPa).
 - 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 manufacturers:
 - 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 (1380 kPa).
 - 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 manufacturers:
 - a. Crane Co.; Crane Valve Group.
 - b. Crane Co.; Crane Valve Group; Stockham Division.
 - c. Milwaukee Valve Company.
 - d. NIBCO INC.
 - e. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
 - f. Or approved equal.
- 2. Description:
 - a. Standard: MSS SP-70, Type I.



- b. CWP Rating: 200 psig (1380 kPa).
- 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 manufacturers:
 - a. Crane Co.; Crane Valve Group
 - b. Milwaukee Valve Company.
 - c. NIBCO INC.
 - d. Powell Valves.
 - e. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
 - f. Or approved equal.
- 2. Description:
 - a. Standard: MSS SP-80, Type 1.
 - b. CWP Rating: 200 psig (1380 kPa).
 - 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 (DN 50) 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 (DN 50) and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
 2. For Steel Piping, NPS 2 (DN 50) 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. Bronze Swing Check Valves: Class 125, bronze disc.
 2. Bronze Gate Valves: Class 125, RS.
- 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.

B. Related Sections:

1. Section 055000 "Metal Fabrications" for structural-steel shapes and plates for trapeze hangers for pipe and 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 PERFORMANCE REQUIREMENTS

- A. Design supports for multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.
- B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- C. Design seismic-restraint hangers and supports for piping and equipment and obtain approval from Commissioner.

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:
 - 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:
 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:



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 Material for Cold Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate or ASTM C 552, Type II cellular glass with vapor barrier.
- D. Insulation Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate or 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 (50 mm) 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:
 - 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:
 - 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, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
 - 1. Properties: Nonstaining, 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 specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Sections.
- 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, 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 non-insulated 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, 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, 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, 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, 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, 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.
- M. Comply with MFMA-102 for metal framing system selections and applications that are not specified in piping system Sections.
- 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 (DN 65)] 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 (DN 8 to DN 90): 12 inches (305 mm) long and 0.048 inch (1.22 mm) thick.
 - b. NPS 4 (DN 100): 12 inches (305 mm) long and 0.06 inch (1.52 mm) thick.
 - c. NPS 5 and NPS 6 (DN 125 and DN 150): 18 inches (457 mm) long and 0.06 inch (1.52 mm) thick.
5. Pipes NPS 8 (DN 200) 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).
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 22 05 29

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".

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 must 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 (3.2 mm) 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 (71 deg C).
- 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 (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.
- 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. Piping Color-Coding: Painting of piping is specified in Division 09 Section 099000 "Painting and Coating."
- B. 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.
- C. Pipe Label Color Schedule:
 - 1. Domestic Water Piping:
 - a. Background Color: Green.
 - b. Letter Color: White.
 - 2. Sanitary Waste 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.
 - c. Polyolefin.
 - 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.

- B. Related Sections include the following:

- 1. Division 23 Section 230700 "HVAC Insulation."

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 013300 "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. Detail removable insulation at piping specialties, equipment connections, and access panels.
6. Detail application of field-applied jackets.
7. Detail application at linkages of control devices.
8. Detail field application for each equipment type.

C. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 014000 "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, by a testing and inspecting agency acceptable to Commissioner. 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.

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:
 - 1. Joint Sealants for Cellular-Glass 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.
 - 2. Joint Sealants for Polystyrene Products: Subject to compliance with requirements, provide one of the following:
 - a. Childers Products, Division of ITW; CP-70.
 - b. Foster Products Corporation, H. B. Fuller Company; 30-45/30-46.
 - c. Marathon Industries, Inc.; 405.
 - d. Mon-Eco Industries, Inc.; 44-05.



- e. Vimasco Corporation; 750.
 - f. Or approved equal.
 - 3. Materials must be compatible with insulation materials, jackets, and substrates.
 - 4. Permanently flexible, elastomeric sealant.
 - 5. Service Temperature Range: Minus 100 to plus 300 deg F (Minus 73 to plus 149 deg C).
 - 6. Color: White or gray.
- B. FSK and Metal Jacket Flashing Sealants:
- 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Childers Products, Division of ITW; CP-76-8.
 - b. Foster Products Corporation, H. B. Fuller Company; 95-44.
 - c. Marathon Industries, Inc.; 405.
 - d. Mon-Eco Industries, Inc.; 44-05.
 - e. Vimasco Corporation; 750.
 - f. 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: Aluminum.
- C. 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. GAF Unisil Silicone Flashing
 - c. Flushseal
 - 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.
 - 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. Products: Subject to compliance with requirements, provide products by one of the following:

- 1) GEMCO.
- 2) Midwest Fasteners, Inc.
- 3) AGM Industries, Inc.
- 4) Or approved equal.

- C. Staples: Outward-clinching insulation staples, nominal 3/4-inch- (19-mm-) wide, stainless steel or Monel.

- D. Wire: 0.080-inch (2.0-mm) nickel-copper alloy.

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.

2.10 CORNER ANGLES

- A. PVC Corner Angles: 30 mils (0.8 mm) thick, minimum 1 by 1 inch (25 by 25 mm), PVC according to ASTM D 1784, Class 16354-C. White or color-coded to match adjacent surface.
- B. Aluminum Corner Angles: 0.040 inch (1.0 mm) thick, minimum 1 by 1 inch (25 by 25 mm), 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. 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 Division 07 Section 078400 "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 Division 07 Section 078400 "Firestopping."

3.5 EQUIPMENT, TANK, AND VESSEL INSULATION INSTALLATION

- A. Mineral Fiber, Pipe and Tank Insulation Installation for Tanks and Vessels: Secure insulation with adhesive and anchor pins and speed washers.
 - 1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 100 percent coverage of tank and vessel surfaces.
 - 2. Groove and score insulation materials to fit as closely as possible to equipment, including contours. Bevel insulation edges for cylindrical surfaces for tight joints. Stagger end joints.
 - 3. Protect exposed corners with secured corner angles.
 - 4. Install adhesively attached or self-sticking insulation hangers and speed washers on sides of tanks and vessels as follows:
 - a. Do not weld anchor pins to ASME-labeled pressure vessels.
 - b. Select insulation hangers and adhesive that are compatible with service temperature and with substrate.
 - c. On tanks and vessels, maximum anchor-pin spacing is 3 inches (75 mm) from insulation end joints, and 16 inches (400 mm) o.c. in both directions.



- d. Do not overcompress insulation during installation.
 - e. Cut and miter insulation segments to fit curved sides and domed heads of tanks and vessels.
 - f. Impale insulation over anchor pins and attach speed washers.
 - g. 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.
5. Secure each layer of insulation with stainless-steel or aluminum bands. Select band material compatible with insulation materials.
 6. Where insulation hangers on equipment and vessels are not permitted or practical and where insulation support rings are not provided, install a girdle network for securing insulation. Stretch prestressed aircraft cable around the diameter of vessel and make taut with clamps, turnbuckles, or breather springs. Place one circumferential girdle around equipment approximately 6 inches (150 mm) from each end. Install wire or cable between two circumferential girdles 12 inches (300 mm) o.c. Install a wire ring around each end and around outer periphery of center openings, and stretch prestressed aircraft cable radially from the wire ring to nearest circumferential girdle. Install additional circumferential girdles along the body of equipment or tank at a minimum spacing of 48 inches (1200 mm) o.c. Use this network for securing insulation with tie wire or bands.
 7. Stagger joints between insulation layers at least 3 inches (75 mm).
 8. Install insulation in removable segments on equipment access doors, manholes, handholes, and other elements that require frequent removal for service and inspection.
 9. Bevel and seal insulation ends around manholes, handholes, ASME stamps, and nameplates.
 10. For equipment with surface temperatures below ambient, apply mastic to open ends, joints, seams, breaks, and punctures in insulation.
- B. Flexible Elastomeric Thermal Insulation Installation for Tanks and Vessels: Install insulation over entire surface of tanks and vessels.
1. Apply 100 percent coverage of adhesive to surface with manufacturer's recommended adhesive.
 2. Seal longitudinal seams and end joints.

3.6 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.

3.7 CELLULAR-GLASS INSULATION INSTALLATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of 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 services, secure laps with outward clinched staples at 6 inches (150 mm) o.c.
4. For insulation with factory-applied jackets on below ambient services, 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 Flanges:

1. Install preformed 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 cellular-glass block insulation of same thickness as pipe insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch (25 mm), and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
2. When preformed sections of insulation are not available, install mitered sections of cellular-glass insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of cellular-glass insulation to valve body.
2. 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.

3.8 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.

3.9 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 Flanges:

1. Install preformed 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 mineral-fiber blanket insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch (25 mm), and seal joints with flashing sealant.

C. 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.

D. 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.

3.10 POLYOLEFIN INSULATION INSTALLATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Seal split-tube 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 polyolefin 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 polyolefin 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 cut sections of polyolefin pipe and sheet insulation to valve body.
2. 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.

3.11 POLYSTYRENE INSULATION INSTALLATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of insulation with tape or bands and tighten bands without deforming insulation materials. Orient longitudinal joints between half sections in 3 and 9 o'clock positions on the pipe.
2. For insulation with factory-applied jackets with vapor barriers, do not staple longitudinal tabs but secure tabs with additional adhesive or tape as recommended by insulation material manufacturer and seal with vapor-barrier mastic.
3. All insulation must be tightly butted and free of voids and gaps at all joints. Vapor barrier must be continuous. Before installing jacket material, install vapor-barrier system.

B. Insulation Installation on Pipe Flanges:

1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, same thickness of adjacent pipe insulation, not to exceed 1-1/2-inch (38-mm) thickness.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of polystyrene block insulation of same thickness as pipe insulation.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed insulation sections of same material as straight segments of pipe insulation. Secure according to manufacturer's written instructions.

D. Insulation Installation on Valves and Pipe Specialties:



1. Install preformed section of polystyrene insulation to valve body.
2. 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.

3.12 FIELD-APPLIED JACKET INSTALLATION

A. Where FSK jackets are indicated, install as follows:

1. Draw jacket material smooth and tight.
2. Install lap or joint strips with same material as jacket.
3. Secure jacket to insulation with manufacturer's recommended adhesive.
4. Install jacket with 1-1/2-inch (38-mm) laps at longitudinal seams and 3-inch- (75-mm-) wide joint strips at end joints.
5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.

B. 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.

C. Where metal jackets are indicated, install with 2-inch (50-mm) 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 (300 mm) o.c. and at end joints.

D. 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-presize jackets around individual pipe insulation sections with one end overlapping the previously installed sheet. Install presize 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.

3.13 FINISHES

- A. Equipment and Pipe Insulation with ASJ or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in Division 09 Section 099000 "Painting and Coating".
 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.

3.14 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. 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 service defined in the "Piping Insulation Schedule, General", paragraph 3.14 of this section .
- C. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.15 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.

3.16 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, Type I: 1 inch for all pipes including branches. For exposed pipe jacketing refer to section 3.16.

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 3.16.

C. Storm Water Pipes (Horizontal and Vertical):

1. Mineral-Fiber, Preformed Pipe Insulation with factory applied jacket and PVC fittings, Type I: 1 inch for all pipes including branches. For exposed pipe jacketing refer to section 3.16.

3.17 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. If more than one material is listed, selection from materials listed is Contractor's option.

C. Piping, Concealed:

1. None.

D. Hot, Hot Water Return and Cold Water Piping and Storm Water, Exposed :

1. PVC: 20 mils (0.5 mm) thick.

END OF SECTION 22 07 00

SECTION 22 08 00**COMMISSIONING OF 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. This section includes commissioning process requirements for Plumbing systems, assemblies, and equipment.
- B. Related Sections:
 - 1. DDC General Conditions Section 019113 "General Commissioning Requirements for MEP Systems" for general commissioning process requirements.

1.3 DESCRIPTION

- A. Commissioning is a systematic process of confirming that all building systems perform interactively according to the Owner's Project Requirements and the Basis of Design and continuing through construction, acceptance and the warranty period with actual verification of performance.
- B. The Commissioning process does not take away from or reduce the responsibility of the Contractor to provide a finished and fully functioning product.
- C. The CxA directs and coordinates the commissioning activities and reports to the Commissioner. All members in the construction process work together to fulfill their contracted responsibilities and meet the objectives of the Owner's Project Requirement's as detailed in the Contract Documents.

1.4 DEFINITIONS

- A. Refer to the DDC General Conditions Section for definitions.

1.5 SUBMITTALS

- A. The CxA will review and approve submittals related to the commissioned equipment for conformance to the Contract Documents as it relates to the commissioning process, to the functional performance of the equipment and adequacy for developing test procedures. This

review is intended primarily to aid in the development of functional testing procedures and only secondarily to verify compliance with equipment specifications. The CxA will notify the Contractor, or Commissioner as requested, of items missing or areas that are not in conformance with Contract Documents and which require resubmission.

- B. The CxA will receive a copy of the final approved submittals.
- C. In addition, the Contractor is to provide the following:
 - 1. Certificate of readiness
 - 2. Certificates of completion of installation, prestart, and startup activities.
 - 3. O&M manuals
 - 4. Test reports
- D. Refer to the DDC General Conditions Section 013300 "Submittal Procedures" and Section 019113 "General Commissioning Requirements for MEP Systems" for general commissioning submittal requirements.

1.6 QUALITY ASSURANCE

- A. Test Equipment Calibration Requirements: The Contractor will comply with test manufacturer's calibration procedures and intervals. Recalibrate test instruments immediately after instruments have been repaired resulting from being dropped or damaged. Affix calibration tags to test instruments. Furnish calibration records to CxA upon request.

1.7 COORDINATION

- A. 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.
- B. 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.
- C. 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 shall be provided with the subsequent meeting minutes for review.
- D. Pre-testing Meetings: The Contractor will attend pretest meetings with the Commissioning Team, chaired by the CxA, to review startup reports, pre-test 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.

- E. Testing: Contractor will coordinate with testing personnel and agencies for timing and access for CxA to witness test.
- F. Manufacturers' Inspection and Startup Services: Contractor will coordinate services of manufacturers' inspection and startup services.
- G. Testing, Adjusting and Balancing: Contractor will coordinate with plan and schedule for testing, adjusting and balancing for timing and access for CxA to witness process.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

- A. All standard testing equipment required to perform startup, initial checkout and functional performance testing shall be provided by the Contractor for the equipment being tested. The Contractor will require the Plumbing subcontractor to complete testing. For example, the Contractor shall ultimately be responsible for all standard testing equipment for the plumbing system in Division 22. A sufficient quantity of two-way radios shall be provided by the Contractor.
- B. Proprietary test equipment and software required by any equipment manufacturer for programming and/or start-up, whether specified or not, shall be provided by the manufacturer of the equipment. Manufacturer shall provide the test equipment, demonstrate its use, and assist in the commissioning process as needed. Proprietary test equipment (and software) shall become the property of the City of New York's personnel upon completion of the commissioning process.
- C. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the Specifications. Unless otherwise noted, the following minimum requirements apply: Temperature sensors and digital thermometers shall have a certified calibration within the past year to accuracy of 0.5°F and a resolution of + or - 0.1°F. Pressure sensors shall have an accuracy of + or - 2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year.

PART 3 - EXECUTION

3.1 GENERAL DOCUMENTATION REQUIREMENTS

- A. With assistance from the Contractor, the CxA will prepare Pre-Functional Checklists for all commissioned components, equipment, and systems. These checklists shall be provided to the Contractor for completion. The CxA shall gather and review the completeness and accuracy of these checklists via site visits.
- B. Red-lined Drawings (As-Built): The Contractor will verify all equipment, systems, instrumentation, wiring and components are shown correctly on red-lined drawings. Preliminary red-lined drawings must be made available to the Commissioning Team for use prior to the start

of Functional Performance Testing. Changes, as a result of Functional Testing, must be incorporated into the final as-built drawings, which will be created from the red-lined drawings. The contracted party, as defined in the Contract Documents will create the as-built drawings.

- C. **Operation and Maintenance Data:** The Contractor will provide a copy of O&M literature within 45 days of each submittal acceptance for use during the commissioning process for all commissioned equipment and systems. The CxA will review the O&M literature once for conformance to project requirements. The CxA will receive a copy of the final approved O&M literature once corrections have been made by the Contractor.
- D. **Demonstration and Orientation:** The Contractor will provide demonstration and orientation as required by the specifications. A complete orientation plan and schedule must be submitted by the Contractor to the CxA four weeks (4) prior to any orientation. An orientation agenda for each orientation session must be submitted to the CxA one (1) week prior the orientation session.

3.2 CONTRACTOR'S RESPONSIBILITIES

- A. Refer to the DDC General Conditions Section 019113 "General Commissioning Requirements for MEP Systems" for Contractor's responsibilities.
- B. The Contractor shall ensure that the plumbing subcontractor attends construction phase controls coordination meetings.
- C. The Contractor shall ensure that the plumbing subcontractor attends domestic water balancing review and coordination meetings.
- D. The Contractor shall ensure that the plumbing subcontractor participates in plumbing systems, assemblies, equipment, and component maintenance orientation and inspection as directed by the CxA.
- E. Provide information requested by the CxA for final commissioning documentation.
- F. Prepare preliminary schedule for Plumbing system orientations and inspections, operation and maintenance manual submissions, orientation sessions, pipe and duct system testing, flushing and cleaning, equipment start-up, testing and balancing and task completion for The City of New York. Distribute preliminary schedule to commissioning team members. 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.
- G. Provide detailed startup procedures.
- H. 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.
- I. Provide a written schedule frequency to review the various set-points and reset schedules to ensure they are current relevant and efficient values.
- J. Respond to provided new deficiencies and/or responses within five (5) business days.

- K. 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.
- L. Coordinate with the CxA to provide 48-hour advance notice so that the witnessing of equipment and system start-up and testing can begin.
- M. 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.
- N. 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.
 - 1. Domestic Water piping.
 - 2. Sanitary waste and vent piping, storm drainage piping, and sump pumps.
- O. The equipment supplier shall document the performance of their equipment.
- P. Provide a complete set of red-lined drawings to the CxA prior to the start of Functional Performance Testing.
- Q. Test, Adjust and Balance subcontractor, under the direction of the Contractor
 - 1. Attend initial commissioning coordination meeting scheduled by the CxA.
 - 2. Submit the site-specific testing and balancing plan to the CxA and Commissioner for review and acceptance.
 - 3. Attend the testing and balancing review meeting scheduled by the CxA. Be prepared to discuss the procedures that shall be followed in testing, adjusting, and balancing the HVAC&R system.
 - 4. At the completion of the testing and balancing work, and the submittal of the final testing and balancing report, notify the HVAC&R subcontractor and the Contractor.
 - 5. Participate in verification of the testing and balancing report, which will consist of repeating measurements contained in the testing and balancing reports. Assist in diagnostic purposes when directed.
 - 6. Provided recommended setpoints as determined by testing, adjusting, and balancing such as static pressure and differential pressure setpoints.
- R. Contractor responsibilities to be completed by Equipment Suppliers:
 - 1. 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.
 - 2. Assist in equipment testing.
 - 3. Provide information requested by CxA regarding equipment sequence of operation and testing procedures.

3.3 CxA'S RESPONSIBILITIES

A. Roles and Responsibilities

- 1. Refer to the DDC General Conditions Section 019113 "General Commissioning Requirements for MEP Systems" for general CxA responsibilities.

3.4 TESTING PREPARATION

- A. Certify in writing to the CxA that Plumbing systems, subsystems, and equipment have been installed, calibrated, and started and are operating according to the Contract Documents.
- B. Certify in writing to the CxA that Plumbing instrumentation and control systems have been completed and calibrated, that they are operating according to the Contract Documents, and that pretest set points have been recorded.
- C. Certify in writing that testing, adjusting, and balancing procedures have been completed and that testing, adjusting, and balancing reports have been submitted, discrepancies corrected, and corrective work approved.
- D. Place systems, subsystems, and equipment into operating mode to be tested (e.g., normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).
- E. Inspect and verify the position of each device and interlock identified on checklists.
- F. Check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.
- G. Testing Instrumentation: Install measuring instruments and logging devices to record test data as directed by the CxA.

3.5 TESTING, ADJUSTING AND BALANCING VERIFICATION

- A. Prior to performance of Testing, Adjusting, and Balancing work, provide copies of reports, sample forms, checklists, and certificates to the CxA.
- B. Notify the CxA at least ten (10) days in advance of testing and balancing Work, and provide access for the CxA to witness testing and balancing Work.
- C. Provide technicians, instrumentation, and tools to verify testing and balancing of HVAC&R systems at the direction of the CxA.
 - 1. The CxA will notify the Contractor ten (10) days in advance of the date of field verification. Notice will not include data points to be verified.
 - 2. The Contractor will ensure that the testing and balancing subcontractor shall use the same instruments (by model and serial number) that were used when original data were collected.
 - 3. Failure of an item includes, other than sound, a deviation of more than 10 percent. Failure of more than 10 percent of selected items shall result in rejection of final testing, adjusting, and balancing report. For sound pressure readings, a deviation of 3 dB shall result in rejection of final testing. Variations in background noise must be considered.
 - 4. Remedy the deficiency and notify the CxA so verification of failed portions can be performed.

3.6 GENERAL TESTING REQUIREMENTS

- A. Provide technicians, instrumentation, and tools to perform commissioning test at the direction of the CxA.
- B. Scope of Plumbing testing shall include entire Plumbing installation, from central equipment for heat generation and refrigeration through distribution systems to each conditioned space. Testing shall include measuring capacities and effectiveness of operational and control functions.
- C. Test all operating modes, interlocks, control responses, and responses to abnormal or emergency conditions, and verify proper response of building automation system controllers and sensors.
- D. The CxA along with the Contractor will ensure that the plumbing subcontractor, testing and balancing subcontractor, and plumbing Instrumentation and Control subcontractor shall prepare detailed testing plans, procedures, and checklists for plumbing systems, subsystems, and equipment.
- E. Tests will be performed using design conditions whenever possible.
- F. 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.
- G. The CxA may direct that set points be altered when simulating conditions is not practical.
- H. 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.
- I. If tests cannot be completed because of a deficiency outside the scope of the Plumbing system, document the deficiency and report it to the Commissioner. After deficiencies are resolved, reschedule tests.
- J. If the testing plan indicates specific seasonal testing, complete appropriate initial performance tests and documentation and schedule seasonal tests.

3.7 PLUMBING SYSTEMS, SUBSYSTEMS, AND EQUIPMENT TESTING PROCEDURES

- A. Equipment Testing and Acceptance Procedures: Testing requirements are specified in individual Division 22 sections. Provide submittals, test data, inspector record, and certifications to the CxA.
- B. Plumbing Instrumentation and Control System Testing: Field testing plans and testing requirements are specified in Division 23 Section 230993 "Sequence of Operations for HVAC Controls". Assist the CxA with preparation of testing plans.
- C. Pipe system cleaning, flushing, hydrostatic tests, and chemical treatment: Test requirements are specified in Division 22 piping Sections. Plumbing subcontractor shall prepare a pipe system cleaning, flushing, and hydrostatic testing plan. Provide cleaning, flushing, testing, and treating plan and final reports to the CxA. Plan shall include the following:



1. Sequence of testing and testing procedures for each section of pipe to be tested, identified by pipe zone or sector identification marker. Markers shall be keyed to Drawings for each pipe sector, showing the physical location of each designated pipe test section. Drawings keyed to pipe zones or sectors shall be formatted to allow each section of piping to be physically located and identified when referred to in pipe system cleaning, flushing, hydrostatic testing, and chemical treatment plan.
 2. Description of equipment for flushing operations.
 3. Minimum flushing water velocity.
 4. Tracking checklist for managing and ensuring that all pipe sections have been cleaned, flushed, hydrostatically tested, and chemically treated.
- D. Plumbing Distribution System Testing: Provide technicians, instrumentation, tools, and equipment to test performance of air, fuel gas, sanitary waste and vent piping, storm drainage piping, sprinkler and domestic water distribution systems. The CxA shall determine the sequence of testing and testing procedures for each equipment item and pipe section to be tested.
- E. Vibration and Sound Tests: Provide technicians, instrumentation, tools, and equipment to test performance of vibration isolation and seismic controls.
- F. The work included in the commissioning process involves a complete and thorough evaluation of the operation and performance of all components, systems and sub-systems. Commissioning shall be performed on equipment and systems including but not limited to the following:
1. Domestic Water Piping
 2. Sanitary Piping
 3. Stormwater Piping
 4. Electric Water Heaters
 5. Expansion Tanks
 6. Domestic Water Booster Pump
 7. Hot Water Circulation Pump

3.8 DEFICIENCIES/NON-CONFORMANCE, FAILURE DUE TO MANUFACTURER DEFECT

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 shall be noted and reported to the Commissioner and Contractor on a standardized form.
2. The Contractor shall respond to new deficiencies within five (5) business days. The response shall indicate the proposed means of correcting the issue and the anticipated date of correction. If further information is required to clarify the issue, the Contractor's response shall include a request such clarification. If the Contractor understands that the issue has been resolved or was noted in error, the Contractor's response shall provide an explanation of their reasoning, including reference to Contract Documents as necessary.
3. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CxA.
4. Every effort will 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 the issue does not require further clarification for the Contractor to resolve, the CxA documents the deficiency and the Contractor's response and corrections or plans for correction. The CxA and the Contractor then proceed to another test or sequence. Once the Contractor corrects the deficiency, the test is rescheduled and repeated to demonstrate correct operation or function.
7. When additional information is required about any deficiency, whether to clarify the issue or to clarify the means of resolution or acceptance, the CxA documents the deficiency and the Contractor's response. The CxA will send the deficiency to the Commissioner and the Contractor, who shall forward to any subcontractors required for the correction. Once all parties are in agreement as to the means of resolving the issue, the CxA will document the agreed-upon resolution process. The CxA will document the correction or resolution. If the correction requires work by the Contractor, the Contractor and CxA will reschedule the test to demonstrate correct operation and function.
8. Deficiencies that are not corrected at the time of documentation, shall be completed by the affected Contractor and photo evidence of the deficiency resolution shall be sent to both the Commissioner and the CxA.

B. Failure due to Manufacturer Defect

1. If 10% or three, whichever is greater, of identical pieces (size alone does not constitute a difference) of equipment fail to perform to the Contract Documents (mechanically or substantively) due to manufacturing defect, not allowing it to meet its submitted performance spec, all identical units may be considered unacceptable by the CxA and the Commissioner. In such case, the Contractor shall provide the Commissioner with the following:
 - a. Within one week of notification from the Contractor the manufacturer's representative shall examine all other identical units making a record of the findings. The findings shall be provided to the Commissioner within two weeks of the original notice.
 - b. Within two weeks of the original notification, the Contractor or manufacturer shall 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 shall not significantly exceed the specification requirements of the original installation.
 - c. The 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 shall replace or repair all identical items, at their expense and extend the warranty accordingly, if the original equipment warranty had begun. The replacement/repair work shall proceed with reasonable speed beginning within one week from when parts can be obtained.

3.9 APPROVAL

- A. The CxA notes each satisfactorily demonstrated function on the test form. Formal approval of the functional test is made later after review by the CxA. The CxA recommends acceptance of each test to the Commissioner using a standard form.

3.10 SEASONAL TESTING

- A. Seasonal Testing – During the warranty period, seasonal testing (tests delayed until weather conditions are closer to the system's design) shall be completed as part of this contract. The CxA shall coordinate this activity. Tests will be executed, documented and deficiencies corrected by the Contractor, with facilities staff and the CxA witnessing. Any final adjustments to the O&M manuals and record documents due to seasonal testing will be made by the Contractor.

3.11 OPERATION AND MAINTENANCE MANUALS

- A. The Operation and Maintenance Manuals shall conform to Contract Documents requirements as stated in the DDC General Conditions Section 017839 "Contract Record Documents" and Section 019113 "General Commissioning Requirements for MEP Systems."
- B. The specific content and format requirements for the standard O&M manuals are detailed in the DDC General Conditions Section 017839 "Contract Record Documents" and Section 019113 "General Commissioning Requirements for MEP Systems." Special requirements for the controls subcontractor and TAB subcontractor are found in Division 23.
- C. CxA Review and Approval – Prior to substantial completion, the CxA shall review the O&M manuals, documentation and record documents for systems that were commissioned to verify compliance with the Specifications. 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 O&M manuals to the Commissioner. The CxA also reviews each equipment warranty and verifies that all requirements to keep the warranty valid are clearly stated.

3.12 INSTRUCTION OF CITY OF NEW YORK PERSONNEL

- A. The Contractor shall be responsible for instruction coordination, scheduling, and ultimately for ensuring that instruction is completed.
- B. The CxA shall oversee the instruction of the City of New York's personnel for commissioned equipment and systems.
 - 1. The CxA shall 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 shall decide how rigorous the instruction should be for each piece of commissioned equipment. The CxA shall communicate the results to the Contractor who will ensure that the subcontractors and vendors are also notified about the results.
 - 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 individual sections listed in DDC's General Conditions Section 017900 "Demonstration and Owners' Pre-Acceptance Orientation."
 - 3. The Contractor shall 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. For the primary equipment, the Contractor shall ensure that the controls subcontractor provide a discussion of the control of the equipment during the mechanical or electrical instruction conducted by each subcontractor or vendor.
6. Instruction documentation shall include the following items:
 - a. Copy of the instruction plan, including schedule, syllabus, and agenda.
 - b. Copy of the Owner's Project Requirements.
 - c. Copy of the Basis of Design.
 - d. Compiled operations manuals.
 - e. Compiled maintenance manuals.
 - f. Completed manufacturer instruction manuals.
 - g. Red-lined drawings.
7. 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.
8. At one of the instruction sessions, the CxA presents a presentation discussing the use of the blank functional test forms for re-commissioning equipment.
9. Video recording of the instruction sessions may be provided by the CxA in electronic format, at the discretion of the Commissioner.

END OF SECTION 220800

THIS PAGE INTENTIONALLY LEFT BLANK

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:
 - 1. Domestic water piping inside the building.
- B. Related Sections
 - 1. Section 221119 "Domestic Water Piping Specialties" for water distribution piping specialties.

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 013300 "Submittal Procedures".

1.4 SUBMITTALS

- A. Field quality-control test reports.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 014000 "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 must 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.

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 (ASTM B 88M, Types A and B), 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 Division 22 Section 220523 "General-Duty Valves for Plumbing Piping."
- B. Balancing and drain valves are specified in Division 22 Section 221119 "Domestic Water Piping Specialties."

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 EXCAVATION

- A. Excavating, trenching, and backfilling are specified in Division 31 Section 312300 "Excavation and Fill."

3.3 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. 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 L ; copper pressure fittings; and soldered joints.
- E. 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.
- F. Aboveground Domestic Water Piping: Use any of the following piping materials for each size range:
 - 1. NPS 1 (DN 25) and Smaller: Hard copper tube, Type L; copper pressure fittings; and soldered joints.
 - 2. NPS 1-1/4 and NPS 1-1/2 (DN 32 and DN 40): Hard copper tube, Type L copper pressure fittings; and soldered joints.
 - 3. NPS 2 (DN 50): Hard copper tube, Type L (Type B); copper pressure fittings; and brazed joints.

3.4 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 (DN 50) and smaller. Use cast-iron gate valves with flanged ends for piping NPS 2-1/2 (DN 65) and larger.
 2. Throttling Duty: Use bronze ball or globe valves for piping NPS 2 (DN 50) and smaller. Use cast-iron butterfly valves with flanged ends for piping NPS 2-1/2 (DN 65) 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 (DN 50) and smaller. Use butterfly or gate valves for piping NPS 2-1/2 (DN 65) 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 (DN 50) and smaller and butterfly valves for piping NPS 2-1/2 (DN 65) and larger. Balancing valves are specified in Division 22 Section 221119 "Domestic Water Piping Specialties." Contractor shall submit the kit to the City of New York after the balancing job is complete.
- 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 Division 22 Section 221119 "Domestic Water Piping Specialties."

3.5 PIPING INSTALLATION

- A. Basic piping installation requirements are specified in Division 22 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 Division 22 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. Drain valves and strainers are specified in Division 22 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.

3.6 JOINT CONSTRUCTION

- A. Basic piping joint construction requirements are specified in Division 22 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 2144. 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.

3.7 ROUGHING-IN FOR WATER METERS

- A. Rough-in domestic water piping for water meter installation according to utility company's requirements.
- B. Water meters will be furnished and installed by utility.

3.8 HANGER AND SUPPORT INSTALLATION

- A. Pipe hanger and support devices are specified in Division 22 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 (30 m): MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet (30 m): MSS Type 49, spring cushion rolls, if indicated.
 - 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 Division 22 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 (10 mm).

- E. Install supports for vertical steel piping every 15 feet (4.5m).
- F. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 3/4 (DN 20) and Smaller: 60 inches (1500 mm) with 3/8-inch (10-mm) rod.
 - 2. NPS 1 and NPS 1-1/4 (DN 25 and DN 32): 72 inches (1800 mm) with 3/8-inch (10-mm) rod.
 - 3. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 96 inches (2400 mm) with 3/8-inch (10-mm) rod.
 - 4. NPS 2-1/2 (DN 65): 108 inches (2700 mm) with 1/2-inch (13-mm) rod.
 - 5. NPS 3 to NPS 5 (DN 80 to DN 125): 10 feet (3 m) with 1/2-inch (13-mm) rod.
- G. Install supports for vertical copper tubing every 10 feet (3m).
- H. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.9 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 plumbing code. 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 (DN 65) and larger.

3.10 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. Reinspection: If Commissioner finds that piping will not pass test or inspection, make required corrections and arrange for reinspection.
 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 (345 kPa) 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.

3.11 CLEANING

- A. Clean and disinfect potable domestic water piping using purging and disinfecting procedures prescribed by the Commissioner.
- B. Submit water samples in sterile bottles to the lab determined by 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. Strainers.
 - 6. Hose bibbs.
 - 7. Wall hydrants.
 - 8. Drain valves.
 - 9. Water hammer arresters.
 - 10. Trap-seal primer valves.
 - 11. Water Meter.

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 013300 "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 014000 "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 "LEAD-FREE" CERTIFICATION

- A. All products used in Domestic Water cold and hot water systems must be "LEAD-FREE" certified.

1.7 PERFORMANCE REQUIREMENTS

- A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig (860 kPa), unless otherwise indicated.

PART 2 - PRODUCTS

2.1 VACUUM BREAKERS

- A. Pipe-Applied, Pressure-Type, Spill-Resistant Vacuum Breakers:
 1. Anti-Siphon Pressure Vacuum Breaker must be Watts Model LF008CQT-SC or approved equal listed below:
 - 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 REDUCED-PRESSURE PRINCIPAL BACKFLOW PREVENTER:

- A. Basis-of-Design Product: Subject to compliance with requirements, provide "LEAD-FREE" certified, backflow preventer by Wilkins Model 975XL2MS with Flood Control System consisting of Solenoid Control Valve Zurn Model ZW206 and Controller or comparable product by one of the following manufacturers:
 - 1. Watts Model U919QT with Flood Control Valve and Controller.
 - 2. Febco Model LF825Y with Flood Control Valve and Controller.
 - 3. AMES Model U400B with Flood Control Valve and Controller.
 - 4. Or approved equal.
- B. Standard: ASSE 1015.
- C. Operation: Continuous-pressure applications, unless otherwise indicated.
- D. Pressure Loss: 12 psig (35 kPa) maximum, through middle 1/3 of flow range.
- E. Size: 2" NPS (50 DN).
- F. Design Flow Rate: 50 gpm.
- G. Selected Unit Flow Range Limits: 10-55 gpm.
- H. Pressure Loss at Design Flow Rate: 12 psig (kPa).
- I. Body: Cast Bronze
- J. End Connections: Threaded.
- K. Configuration: Designed for horizontal, straight through flow.
- L. Accessories:



1. Valves: Ball type with threaded ends on inlet and outlet of NPS 2 (DN 50) and smaller; outside screw and yoke gate-type with flanged ends on inlet and outlet of NPS 2-1/2 (DN 65) and larger.
 2. Air-Gap Fitting: ASME A112.1.2, matching backflow-preventer connection.
 3. Integral Relief Valve Monitoring Switch with dry contact to transmit signal to remote location.
 4. Alarm Signal must be transmitted to BMS.
- M. 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.
- N. Provide backflow-preventer kit, factory calibrated, with gages, fittings, hoses and carrying case with test-procedure instructions.

2.3 BALANCING VALVES

- A. Basis-of-the Design Product: Balancing Valve must be memory-stop Watts Model LFCSM-61-S or comparable product by one of the following manufacturers:
1. Conbraco Industries, Inc.
 2. Crane Co.; Crane Valve Group; Crane Valves.
 3. Milwaukee Valve Company.
 4. NIBCO INC.
 5. Red-White Valve Corp.
 6. Or approved equal.
- B. Standard: MSS SP-110 for two-piece, copper-alloy ball valves.
- C. "LEAD-FREE" Certification: Required
- D. Pressure Rating: 400-psig (2760-kPa) minimum CWP.
- E. Size: NPS 2 (DN 50) or smaller.
- F. Body: Brass or Copper alloy.
- G. Port: Standard or full port.
- H. Ball: Chrome-plated brass.
- I. Seats and Seals: Replaceable.
- J. End Connections: Solder joint or threaded.
- K. Handle: Vinyl-covered steel with memory-setting device.

2.4 TEMPERATURE-ACTUATED WATER MIXING VALVES

- A. Basis of the Design Product: Primary, Thermostatic, Water Mixing Valve must high-low Parallel Installation with adjustable high temperature limit stop, shut-off valves and integral



inlet check valves, Leonard 370-LF-BV or comparable product from one of the following manufacturers:

1. Holby Valves.
 2. Armstrong International, Inc.
 3. Lawler Manufacturing Company, Inc.
 4. Leonard Valve Company.
 5. Powers; a Watts Industries Co.
 6. Symmons Industries, Inc.
 7. Or approved equal.
- B. Standards: ASSE 1017, 1070.
- C. "LEAD-FREE" Certification: Required
- D. Pressure Rating: 125 psig (860 kPa).
- E. Type: Exposed-mounting, thermostatically controlled water mixing valve.
- F. Material: Bronze body with corrosion-resistant interior components.
- G. Connections: Union inlets and outlet.
- H. Accessories: Manual temperature control, check stops on hot- and cold-water supplies, and adjustable, temperature-control handle.
- I. Valve Pressure Rating: 125 psig (860 kPa) minimum, unless otherwise indicated.
- J. Tempered-Water Setting: 90 deg F.
- L. Tempered-Water Design Flow Rates: Varies.
- M. Valve Finish: Rough bronze.
- N. Piping Finish: Copper.

2.5 WALL HYDRANTS, WH

- A. Basis of the design product: Wall hydrant must be non-freeze, bronze nickel-plated quarter turn with hose connection, integral vacuum breaker, "T" handle key, adjustable wall clamp and backer plate, J.R. Smith Model 5609QT-WC or comparable product from one of the following manufacturers:
1. Josam Company.
 2. MIFAB, Inc.
 3. Watts Drainage Products Inc.
 4. Zurn Plumbing Products Group; Light Commercial Operation.
 5. Zurn Plumbing Products Group; Specification Drainage Operation.
 6. Or approved equal.
- B. Standard: ASME A112.21.3M for concealed-outlet, self-draining wall hydrants.
- C. Pressure Rating: 125 psig (860 kPa).
- D. Operation: Loose key.

- E. Casing and Operating Rod: Of length required to match wall thickness. Include wall clamp.
- F. Inlet: NPS 3/4 (DN 20).
- G. Outlet: Concealed, with integral vacuum breaker and garden-hose thread complying with ASME B1.20.7.
- H. Box: n/a
- I. Backer Plate Finish: Chrome Plated.
- K. Outlet: Concealed, with integral vacuum breaker and garden-hose thread complying with ASME B1.20.7.
- L. Nozzle and Wall-Plate Finish: Nickel bronze.
- M. Operating Keys(s): Two with each wall hydrant.
- N. Vacuum breaker: Integrated

2.6 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.

2.7 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.

2.8 TRAP PRIMER

- A. Mini-primer electronic trap primer, PPP Model MPB-500-115V with distribution unit PPP series DU for four connections or approved equal.
- B. Trap primer must be installed in accordance with manufacturer's recommendations.

2.9 WATER METERS

- A. Manufacturers:
 1. Basis-of-Design Product: Subject to compliance with NYC DEP 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 INSTALLATION

- A. Refer to Division 22 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.
 - 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 or indirect waste receptacle. Locate air-gap device attached to or under backflow preventer. Simple air break is 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-principle 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-principle backflow preventer and double-check backflow-prevention assembly according to NYC DEP and the device's reference standard.
- 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:
 - 1. Pipe, tube, and fittings.
 - 2. Special pipe fittings.

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 013300 "Submittal Procedures".

1.4 SUBMITTALS

- A. Field quality-control inspection and test reports.
- B. Pipes and Fittings.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 014000 "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.

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. Solvent Stack Fittings: ASME B16.45 or ASSE 1043, hubless, cast-iron aerator and deaerator drainage fittings.
 2. Shielded Couplings: heavy duty ASTM C 1540 assembly of metal shield or housing, corrosion-resistant fasteners, and rubber sleeve with integral, center pipe stop.
 - a. Heavy duty, 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. 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 in finished areas must be provided with PVC Jacketing.

3.3 PIPING INSTALLATION

- A. Basic piping installation requirements are specified in Division 22 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 Division 22 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 Division 22 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 3 (DN 80) and smaller; 1 percent downward in direction of flow for piping NPS 4 (DN 100) 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 Division 22 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 Nonpressure Piping Joints: Join piping according to ASTM D 2665.

3.5 VALVE INSTALLATION

- A. General-duty valves are specified in Division 22 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 Division 22 Section 221319 "Sanitary Waste Piping Specialties."

3.6 HANGER AND SUPPORT INSTALLATION

- A. Seismic-restraint devices are not required.
- B. Pipe hangers and supports are specified in Division 22 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 (30 m): MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet (30 m), 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.
- C. Install supports according to Division 22 Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
- D. Support vertical piping and tubing at base and at each floor.
- E. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch (10-mm) minimum rods.
- F. 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 (DN 40 and DN 50): 60 inches (1500 mm) with 3/8-inch (10-mm) rod.
 2. NPS 3 (DN 80): 60 inches (1500 mm) with 1/2-inch (13-mm) rod.
 3. NPS 4 and NPS 5 (DN 100 and DN 125): 60 inches (1500 mm) with 5/8-inch (16-mm) rod.
 4. NPS 6 (DN 150): 60 inches (1500 mm) with 3/4-inch (19-mm) rod.
 5. Spacing for 10-foot (3-m) lengths may be increased to 10 feet (3 m). Spacing for fittings is limited to 60 inches (1500 mm).
- G. Install supports for vertical cast-iron soil piping every 15 feet (4.5 m).
- H. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/4 (DN 32): 84 inches (2100 mm) with 3/8-inch (10-mm) rod.
 2. NPS 1-1/2 (DN 40): 108 inches (2700 mm) with 3/8-inch (10-mm) rod.
 3. NPS 2 (DN 50): 10 feet (3 m) with 3/8-inch (10-mm) rod.
 4. NPS 2-1/2 (DN 65): 11 feet (3.4 m) with 1/2-inch (13-mm) rod.
 5. NPS 3 (DN 80): 12 feet (3.7 m) with 1/2-inch (13-mm) rod.
 6. NPS 4 and NPS 5 (DN 100 and DN 125): 12 feet (3.7 m) with 5/8-inch (16-mm) rod.
 7. NPS 6 (DN 150): 12 feet (3.7 m) with 3/4-inch (19-mm) rod.
- I. Install supports for vertical steel piping every 15 feet (4.5 m).
- J. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/4 (DN 32): 72 inches (1800 mm) with 3/8-inch (10-mm) rod.
 2. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 96 inches (2400 mm) with 3/8-inch (10-mm) rod.
 3. NPS 2-1/2 (DN 65): 108 inches (2700 mm) with 1/2-inch (13-mm) rod.
 4. NPS 3 to NPS 5 (DN 80 to DN 125): 10 feet (3 m) with 1/2-inch (13-mm) rod.
 5. NPS 6 (DN 150): 10 feet (3 m) with 5/8-inch (16-mm) rod.
- K. Install supports for vertical copper tubing every 10 feet (3 m).
- L. 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 plumbing code. Refer to Division 22 Section 221319 "Sanitary Waste Piping Specialties."
2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by NYC plumbing code 2014.
3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by NYC plumbing code 2014. Refer to Division 22 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. Reinspection: If Commissioner finds that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- 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 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 013300 "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 014000 "Quality Requirements".
- B. Drainage piping specialties must bear label, stamp, or other markings of specified testing agency.



PART 2 - PRODUCTS

2.1 CLEANOUTS

A. Exposed Cast-Iron Cleanouts:

1. Manufacturers:
 - 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:
 - 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: 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:
 - 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 in Bathrooms and other Finish Areas:

1. Basis-of-Design Product: Subject to Compliance with requirements, provide J.R. Smith Model 2005-A-A075 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. 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; Light Commercial Operation.
 - i. Zurn Plumbing Products Group; Specification Drainage Operation.
 - j. 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 in Utility Room and other similar areas

1. Basis-of-Design Product: Subject to Compliance with requirements, provide J.R. Smith Model 2360-P075-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. 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; Light Commercial Operation.
 - i. Zurn Plumbing Products Group; Specification Drainage Operation.
 - j. 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: 12".
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 where shown on drawings.

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:

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide duco cast iron with acid resistant coated interior and exterior funnel drain with no-hub adaptor, 4" outlet, J.R Smith Figure 3821 or comparable product from one of the following manufacturers:
 - a. Josam Company.
 - b. Watts Drainage.
 - c. MIFAB, Inc.
 - d. Approved Equal.

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 backwater valve Model 7012 manufactured by J.R.Smith or a comparable product by one of the following:
 - a. Josam Company; Josam Div.
 - b. MIFAB, Inc.
 - c. Smith, Jay R. Mfr. 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 A112.14.1.
 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 1/4" 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.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.



3.2 INSTALLATION

- A. Refer to Division 22 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. 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.
- 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 Commissioner and 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 Division 07 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 Division 22 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

SECTION 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:
 - 1. Pipe, tube, and fittings.
 - 2. Special pipe fittings.

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 013300 "Submittal Procedures".

1.4 SUBMITTALS

- A. Field quality-control inspection and test reports.
- B. Pipes and Fitting materials.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 014000 "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.

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 1540 assembly of stainless steel shield or housing, corrosion-resistant fasteners, and rubber sleeve with integral, center pipe stop.
 - a. Heavy-Duty, Shielded, Stainless-Steel 4000 Couplings: With stainless-steel shield, stainless-steel bands and tightening devices, and ASTM C 1540, 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.
- D. All new and existed storm water pipes, vertical and horizontal, must be provided with insulation.

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 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 Division 22 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 Division 22 Section 221423 "Storm Drainage Piping Specialties."
- 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 Division 22 Section 220500 "Common Work Results for Plumbing."
- D. Install wall-penetration-fitting system at each service pipe penetration through foundation wall. Make installation watertight.
- 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 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.
- G. 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.
- H. 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.
- I. All new and existed storm water pipes, vertical and horizontal, must be provided with insulation.
- 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 Division 22 Section "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 valve are specified in Division 22 Section 221423 "Storm Drainage Piping Specialties."

3.6 HANGER AND SUPPORT INSTALLATION

- A. Seismic-restraint devices are not required for this project.
- B. Pipe hangers and supports are specified in Division 22 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 (30 m): MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet (30 m), 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.
- C. Install supports according to Division 22 Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
- D. Support vertical piping and tubing at base and at each floor.
- E. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch (10-mm) minimum rods.



- F. 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 (DN 40 and DN 50): 60 inches (1500 mm) with 3/8-inch (10-mm) rod.
 2. NPS 3 (DN 80): 60 inches (1500 mm) with 1/2-inch (13-mm) rod.
 3. NPS 4 and NPS 5 (DN 100 and DN 125): 60 inches (1500 mm) with 5/8-inch (16-mm) rod.
 4. NPS 6 (DN 150): 60 inches (1500 mm) with 3/4-inch (19-mm) rod.
 5. Spacing for 10-foot (3-m) lengths may be increased to 10 feet (3 m). Spacing for fittings is limited to 60 inches (1500 mm).
- G. Install supports for vertical cast-iron soil piping every 15 feet (4.5 m).
- H. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/4 (DN 32): 84 inches (2100 mm) with 3/8-inch (10-mm) rod.
 2. NPS 1-1/2 (DN 40): 108 inches (2700 mm) with 3/8-inch (10-mm) rod.
 3. NPS 2 (DN 50): 10 feet (3 m) with 3/8-inch (10-mm) rod.
 4. NPS 2-1/2 (DN 65): 11 feet (3.4 m) with 1/2-inch (13-mm) rod.
 5. NPS 3 (DN 80): 12 feet (3.7 m) with 1/2-inch (13-mm) rod.
 6. NPS 4 and NPS 5 (DN 100 and DN 125): 12 feet (3.7 m) with 5/8-inch (16-mm) rod.
 7. NPS 6 (DN 150): 12 feet (3.7 m) with 3/4-inch (19-mm) rod.
- I. Install supports for vertical steel piping every 15 feet (4.5 m).
- J. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/4 (DN 32): 72 inches (1800 mm) with 3/8-inch (10-mm) rod.
 2. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 96 inches (2400 mm) with 3/8-inch (10-mm) rod.
 3. NPS 2-1/2 (DN 65): 108 inches (2700 mm) with 1/2-inch (13-mm) rod.
 4. NPS 3 to NPS 5 (DN 80 to DN 125): 10 feet (3 m) with 1/2-inch (13-mm) rod.
 5. NPS 6 (DN 150): 10 feet (3 m) with 5/8-inch (16-mm) rod.
- K. Install supports for vertical copper tubing every 10 feet (3 m).
- L. 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 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. Reinspection: If Commissioner find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by Commissioner.
- D. Test storm drainage piping according to procedures of New York City Building Code, 2014.

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. Miscellaneous storm drainage piping specialties.

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 013300 "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 014000 "Quality Requirements".
- B. Drainage piping specialties must bear label, stamp, or other markings of specified testing agency.

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-Heavyclass, 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 roof drains J.R.Smith Model 1015-R-C-E-C2_CID or a 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.
- 5. Dimensions of Body: 15-1/4".
- 6. Combination Flashing Ring and Gravel Stop.
- 7. Flow-Control Weirs: Not Required
- 8. Outlet: Bottom, Side Outlet.
- 9. Dome Material: Cast iron.
- 10. Extension: Adjustable Extension Required.
- 11. Underdeck Clamp: Required.
- 12. Sump Receiver: Required.
- 13. Secondary Clamp- Required.

B. Cast-Iron Emergency Roof Drains (ERD):



1. Basis-of-Design Product: Subject to compliance with requirements, provide roof drains J.R. Smith Model 1045-C-R-E-WD02-C2-CID or a 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.
5. Dimensions of Body: 15-1/4".
6. Combination Flashing Ring and Gravel Stop.
7. Flow-Control Weirs: Not required.
8. Solid Water Dam: 2"
9. Outlet: Bottom
10. Dome Material: Cast iron.
11. Extension: Adjustable extension Required.
12. Underdeck Clamp: Required.
13. Sump Receiver: Required.
14. Secondary Clamp: Required.

C. Scupper Drains (Canopy):

1. Basis-of-Design Product: Subject to compliance with requirements, provide scupper drains in gutters. Scupper drain must be J.R. Smith Model 1570-NB or a 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: Scupper drain.
4. Body Material: Cast iron.
5. Dimensions of Body: 10" x 3".
6. Flashing clamp: Required.
7. Control Weirs: Not required.
8. Solid Water Dam: Not required
9. Outlet: 45 degrees, angle outlet.



10. Dome Material: duco Cast iron.
11. Extension Collars: Not required.
12. Underdeck Clamp: Not required.
13. Sump Receiver: Not required.

D. Gutter Drains:

1. Basis-of-Design Product: Subject to compliance with requirements, provide scupper drains in gutters. Scupper drain must be J.R. Smith Model 1330-R-C-CID or a 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: Scupper drain.
4. Body Material: Cast iron.
5. Dimensions of Body: 8" Dia.
6. Flashing clamp: Required.
7. Control Weirs: Not required.
8. Solid Water Dam: Not required
9. Outlet: Bottom.
10. Dome Material: Duco Cast iron.
11. Extension Collars: Not required.
12. Underdeck Clamp: Required.
13. Sump Receiver: Required.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. Refer to Division 22 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. Roof materials are specified in Division 07.
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 12 inches (305 mm) 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 other Division 22 Sections. 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 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. Commercial, storage electric water heaters.
 - 2. Water heater accessories.

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 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 014000 "Quality Requirements".
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to 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.

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 or workmanship 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): From date of Substantial Completion:
 - a. Commercial Electric Water Heaters: Five years.

PART 2 - PRODUCTS

2.1 COMMERCIAL ELECTRIC WATER HEATERS

- A. Commercial, Storage Electric Water Heaters: Comply with UL 1453 requirements for storage-tank-type water heaters.
 - 1. Manufacturers:
 - 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, 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 18 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 WH-1
 - a. Capacity: 20 gal
 - b. Recovery: 12.4 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.
- 7. Capacity and Characteristics WH-2
 - a. Capacity: 10 gal
 - b. Recovery: 12.4 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 HOT WATER CIRCULATOR

A. Commercial Hot Water Circulators:

1. Manufacturers:
 - a. Bell and Gossett.
 - b. Taco.
 - c. Armstrong.
 - d. Or approved equal.
2. Pump must be LEAD-free, horizontal, oil-lubricated type, rated for 125 psi.
3. The motor must be of the drip-proof, sleeve-bearing, quiet operating, rubber-mounted construction. Motors must have built-in thermal overload protectors.
4. For pump model and rating refer to schedule on contract drawings.

2.3 AQUASTAT AND TIMER

A. Basis-of Design Product: Provide Automatic Timer and Aquastat Combination consisting of automatic timer kit TC-1 by Bell and Gossett and AQ-1/2 aquastat by Bell and Gossett or comparable product from the following manufacturers:

1. Johnson Controls.
2. Honeywell.
3. Bell and Gossett.
4. Or Approved Equal.

2.4 EXPANSION TANK

- A. Expansion Tank must be listed for Portable Water applications with all wetted components to be FDA approved.
- B. Tank must be bladder type with steel shell designed and constructed per ASMe Section VIII, Div.1 and heavy duty butyl bladder
- C. Tank must be rated for 125 psig, 240 degree F.

2.5 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 Division 22 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 Division 22 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 Division 26 Section 260526 "Grounding and Bonding for Electrical Systems."
- C. Connect wiring according to Division 26 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 DEMONSTRATION

- A. Engage a factory-authorized service representative to instruct the City of New York's maintenance personnel to adjust, operate, and maintain commercial electric 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. Mop sinks.
 - 11. Drinking Fountain.

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 013300 "Submittal Procedures".

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Retain first paragraph below if fixtures include electrical components and wiring.
- C. Shop Drawings: Diagram power, signal, and control wiring.
- D. 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, Article 100, by a testing agency acceptable to Commissioner, 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 WaterSense 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 DEFINITIONS

- A. Retain abbreviations and terms that remain after this Section has been edited.
- B. ABS: Acrylonitrile-butadiene-styrene plastic.
- C. Accessible Fixture: Plumbing fixture that can be approached, entered, and used by people with disabilities.
- D. FRP: Fiberglass-reinforced plastic.
- E. PMMA: Polymethyl methacrylate (acrylic) plastic.
- F. PVC: Polyvinyl chloride plastic.
- G. 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-H:**

1. Basis-of-Design Product: Subject to compliance with requirements, provide Toto Helix EcoPower Faucet Solis TEL115-D10EM with self-generating hydropowered EcoPower system, flow controller and thermostatic mixing valve or a comparable product by one of the following manufacturers:
 - a. American Standard Companies, Inc.
 - b. Delta Faucet Company.
 - c. Kohler Co.
 - d. Zurn Plumbing Products Group; Commercial Brass Operation.
 - e. Or approved equal.
2. Description: ADA Compliant, Sensor Activated, eco-powered Faucet.
 - a. Body Material: Commercial, solid brass.
 - b. Finish: Polished chrome plate.
 - c. Maximum Flow Rate: 0.5 gpm/ 0.09 gallon per cycle.
 - d. Centers: Single hole.
 - e. Mounting: Deck, exposed.
 - f. Valve Handle(s): Not applicable.
 - g. Inlet(s): NPS 3/8.
 - h. Spout: Rigid type.
 - i. Spout Outlet: 0.5 gpm (1.5 L/min.)
 - j. Operation: Sensor.
 - k. Drain: Chrome Plated Brass Grid Strainer from manufacturers listed in 2.1.A.1 or approved equal.
 - l. Tempering Device: Below Deck Thermostatic Mixing, ASSE 1017 certified, from manufacturers listed in 2.1.A.1 or approved equal.
 - m. Variation: None.
 - n. Transformer: Not required.
 - o. Time Out Setting: 10 seconds.
 - p. Cycle: 0.09 gallon per cycle.

2.2 SINK FAUCETS**A. Pantry Sink Faucets, PS:**

1. Basis-of-Design Product: Subject to compliance with requirements, provide pantry sink faucet Speakman Model SC-3004-8-LD-E with widespread gooseneck spout, wrist blade handles and 1.2 gpm aerator or a comparable product by one of the following:



- a. Kohler.
 - b. American Standard
 - c. Toto
 - d. Or approved equal.
2. Description: ADA compliant, kitchen faucet with widespread gooseneck spout, three-hole fixture. Coordinate faucet inlets with supplies and fixture holes; coordinate outlet with spout and fixture receptor.
 - a. Body Material: Commercial, solid brass.
 - b. Finish: Polished chrome plate.
 - c. Maximum Flow Rate: 2.0 gpm, restricted to 0.5 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: Three hole.
 - h. Mounting: Deck, exposed.
 - i. Handle(s): Single for volume and temperature control.
 - j. Inlet(s): NPS 1/2 (DN 15).
 - k. Spout Type: Widespread gooseneck rigid/swivel spout.
 - l. Spout Outlet: Aerator
 - m. Vacuum Breaker: Not required.
 - n. Operation: Manual.
 - o. Power: Not Required.
 - p. Drain: Grid.

B. Mop Sink Faucets, MS:

1. Basis-of-Design Product: Subject to compliance with requirements, provide service sink faucet American Standard Model 8351.076 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 3/4" 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-H:

1. Basis-of-Design Product: Subject to compliance with requirements, provide flushometer American Standard Selectronic Model 6065.111 as part of American Standard AFWall Millenium FloWise Flushometer Toilet System Model 2257.511 or comparable product by one of the following:
 - a. Kohler Company.
 - b. Zurn Plumbing Products Group; Commercial Brass Operation.
 - c. American Standard.
 - d. Or approved equal.
2. Description: Exposed, Battery Powered 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, top spud, chrome plated.
 - c. Inlet Size: NPS 1 (DN 25).
 - d. Trip Mechanism: Battery powered sensor.
 - e. Consumption: 1.1 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 American Standard Model No. 5905.100.
 - a. Bemis Manufacturing Company.
 - b. Church Seats.
 - c. American Standard.



- 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: Extra 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 equal by one of the following manufacturers:
 - 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. Support must be J.R.Smith Model 0410 or similar product by one of the manufacturers listed in 2.6A, or approved equal.

C. Lavatory Supports, L:

1. Description: Type II, lavatory carrier with concealed arms, tie rod and floor mounted uprights, similar to J.R.Smith Model 0700 or similar product by one of the manufacturers listed in 2.6A, or approved equal for wall-mounting, lavatory-type fixture. Include steel uprights with feet.
2. 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, similar to Wade 614-LK or similar products by one of the manufacturers listed in 2.6A, or approved equal.

2.7 WATER CLOSETS

A. Water Closets, WC-H:

1. Basis-of-Design Product: Subject to compliance with requirements, provide toilet system by American Standard AFWall Millennium "FloWise" 1.1 gpm Flushometer Toilet System Model 2257.511 or a comparable product by one of the following:
 - a. Kohler Co.
 - b. TOTO USA, Inc.
 - c. American Standard.
 - d. Or approved equal.
2. Description: Accessible, wall-mounting, vitreous-china fixture designed for flushometer valve operation.
3. Style: Flushometer valve.
 - 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: 1.1 gal./flush.
 - d. Color: White.
 - e. Spud: 1-1/2" top inlet spud.
4. Toilet Seat: WC.

2.8 LAVATORIES

A. Lavatories, L-H:



1. Basis-of-Design Product: Subject to compliance with requirements, provide lavatory Kohler Soho Model K-2084 or a comparable product by one of the following:
 - a. American Standard
 - b. TOTO USA, Inc.
 - c. Kohler.
 - d. Or approved equal.
2. Description: Accessible, wall-mount, vitreous-china fixture.
 - a. Type: Wall mount, Concealed Arm carrier.
 - b. Size: 20 by 18 inches (508 by 457 mm) 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 custom made undermount sink manufactured by Elkay Model EFRU2115T or a comparable product by one of the following:
 - a. Kohler Co.
 - b. Eljer.
 - c. Elkay.
 - d. Or approved equal.
2. Description: One-bowl, undermount, stainless-steel kitchen sink.
 - a. Overall Dimensions: 23-1/2"x 18-1/4"x6" deep.
 - b. Metal Thickness: #16-gauge type 304 stainless steel.
 - c. Bowl:



- 1) Dimensions: 21"x15-3/4".
- 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.
- j. Drain: heavy duty sink drain, type 304 stainless steel body, strainer basket and tailpiece.

2.10 MOP SINKS

A. Mop Sinks, MS:

1. Basis-of-Design Product: Subject to compliance with requirements, provide stainless steel stone mop basin Elkay Model FLR-2X or a comparable product by one of the following:
 - a. Kohler Co.
 - b. American Standard Company.
 - f. Elkay.
 - g. Or approved equal.
2. Description: Molded Stone basin.
 - a. Overall Dimensions: 32"x 24"x11-1/4"
 - 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, P-trap.

2.11 DRINKING FOUNTAIN

A. Drinking fountain, DF:

1. Basis-of-Design Product: Subject to compliance with requirements, provide drinking fountain with bottle filling station Elkay Model EZWS-EDFP217K with access panel or a comparable product by one of the following:



- a. Haws
 - b. Oasis
 - c. Elkay.
 - d. Or approved equal.
2. Description: No-Lead, ADA compliant, two-level wall mounted Drinking Fountain with Bottle Filling Station.
 - a. Body Material: Commercial, solid brass.
 - b. Finish: Stainless Steel gauge #18
 - c. Maximum Flow Rate: 1.5 gpm.
 - d. Bottle Filler: no-touch, sensor –activated bottle filler.

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 Division 22 Section 220500 "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. Sealants are specified in Division 07 Section 079200 "Joint Sealants."

3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Division 22 Sections. 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 Division 26 Section 260526 "Grounding and Bonding for Electrical Systems."
- D. Connect wiring according to Division 26 Section 260519 "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 the 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. The requirements of this Section apply to all the Work of Division 23.
- B. Provide a complete working installation with all equipment called for in proper operating condition. Documents do not undertake to show or list every item to be provided. When an item not shown or listed, is clearly necessary for proper operation of equipment which is shown or listed, provide an item which will allow the system to function properly at no increase in Contract Sum.

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”.
- B. General:
 - 1. All equipment and accessories must be the product of a manufacturer regularly engaged in its manufacture.
 - 2. All equipment and accessories new, free from defects.
 - 3. Supply all equipment and accessories in compliance with the applicable standards listed and codes listed in this Section.
 - 4. All items of a given type must be the product of the same manufacturer.
 - 5. Install work by craftsmen skilled in trade involved
- C. Materials and equipment must be manufactured, installed and tested as specified in latest editions of applicable publications, standards, rulings and determinations of:
 - 1. 2014 NYC Building Code
 - 2. 2014 NYC Mechanical Code
 - 3. 2014 NYC Fire Code
 - 4. 2014 NYC Fuel Gas Code
 - 5. 2106 NYC Energy Conservation Code
 - 6. American Gas Association (AGA)
 - 7. National Fire Protection Association (NFPA)
 - 8. American Insurance Association (AIA) (formerly National Board of Fire Underwriters)



9. Occupational Safety and Health Act (OSHA)
 10. Underwriter's Laboratories (UL).
 11. Factory Mutual Association (FM)
 12. National Electric Code (NEC)
 13. Environmental Protection Agency (EPA)
 14. National Bureau of Standards (NBS)
- D. All materials and equipment must be listed by Underwriters' Laboratories (UL), and approved by ASME, ANSI, ASTM, AGA, and NEC for intended service.
- E. Most recent editions of applicable specifications and publications of the following organizations form part of these Contract Documents.
1. American National Standards Institute (ANSI)
 2. American Society of Mechanical Engineers (ASME)
 3. National Electrical Manufacturers' Association (NEMA)
 4. American Society for Testing and Materials (ASTM)
 5. American Water Works Association (AWWA)
 6. Plumbing and Drainage Institute (PDI)
 7. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)
 8. Air Moving and Conditioning Association (AMCA)
 9. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
 10. Air Conditioning and Refrigeration Institute (ARI)
 11. Hydraulic Institute (HI)
 12. Tubular Exchanger Manufacturer's Association (TEMA)
 13. Thermal Insulation Manufacturers Association (TIMA)
 14. Associated Air Balance Council (AABC)
 15. A13.1 Scheme for Identification of Piping Systems
 16. Manufacturers Standardization Society of the Valves & Fittings Industry (MSS)
 17. Adhesive and Sealant Council (ASC)
 18. American Society of Sanitary Engineering (ASSE)
 19. American Welding Society (AWS)
 20. Institute of Electrical and Electronic Engineers (IEEE)
 21. Insulated Cable Engineers Association (ICEA)
 22. Certified Ballast Manufacturers (CMB)
 23. Illuminating Engineering Society (IES)
 24. NEBB - National Environmental Balancing Bureau
 25. National Electric Code

1.5 SCOPE OUTLINE

- A. The following is outline scope of work of including but not limited to:
1. Demolition of existing mechanical equipment, ductwork and piping serving the existing library area.
 2. Selective removal and capping of steam supply from adjoining school.
 3. Hoisting and rigging required to complete work of this section.
 4. Vibration isolation



5. Provide factory built variable Refrigerant Volume/ Flow (VRV / VRF) heat recovery air conditioning units complete filtration kit and factory furnished controls, exhaust fans, electric heaters, etc. as scheduled on plans and as specified.
 6. Complete air distribution system including low pressure ductwork, diffusers, registers, grilles, dampers, sound attenuators, constant pressure regulators, etc.
 7. Firestop of penetrations for ductwork and pipe work
 8. Automatic Temperature Controls.
 9. Sheet metal work
 10. Refrigerant and condensate piping
 11. Insulation
 12. Identification
 13. Cleaning and prime painting.
 14. Instruction manual and start up instructions.
 15. Testing and balancing.
- B. Perform work and provide material and equipment as shown on the drawings and/or as specified and/or as indicated in this section of the specifications. Completely coordinate all work of this section with work of other trades and provide a complete and fully functional installation
- C. Drawings and Specifications form complimentary requirements; provide work specified and not shown, and work shown and not specified as though explicitly require by both. Although work is not specifically shown or specified, provide supplementary or miscellaneous items, appurtenances, devices and materials obviously necessary for sound, secure and complete installation.

1.6 RELATED WORK

- A. Related work specified elsewhere: The following work, unless otherwise noted is not included in this section must be performed in other sections:
1. Electric power wiring for all equipment. See division 26.
 2. Starters and variable frequency drives for all equipment
 3. Provision for low voltage transformers, circuit breakers, testing and connections for Direct Digital Control (DDC) power wiring.
 4. Excavation and backfill.
 5. Concrete work, including concrete housekeeping pads and other pads and blocks for vibrating and rotating equipment.
 6. Cutting and patching of masonry, concrete, tile and other parts of structure, drilling for hangers, etc.
 7. Flashing of wall penetrations.
 8. Installation of access panels in floors, walls, furred spaces or above ceilings
 9. Outdoor air intake and exhaust louvers.
 10. Structural supports necessary to distribute loading from equipment to roof or floor, except as specified herein.
 11. Thermal and sound insulation in partitions and ceilings.

1.7 MODIFICATIONS IN LAYOUT

- A. HVAC, Plumbing, Fire Protection, and Electrical Drawings are diagrammatic. They indicate general arrangements of mechanical and electrical systems and other work. They do not show



all offsets required for coordination nor do they show exact routings and locations needed to coordinate with structure and other trades to meet Architectural requirements

- B. In order to obtain the Commissioner's desired aesthetics in spaces used by building occupants, in all such spaces, prior to installation of visible materials, finishes and equipment (including access panels), review Architectural Drawings for desired locations and where not definitely indicated, request information from the Commissioner
- C. Check Contract Drawings, as well as Shop Drawings, of all subcontractors to verify and coordinate spaces in which work of this section will be installed
- D. Maintain maximum headroom at all locations. All piping, duct conduit, and associated components to be as tight to underside of structure as possible.
- E. Make reasonable modifications in layout and components to prevent conflict with work of other trades and to coordinate according to Paragraphs A,B,C,D above. Systems must be run in a rectilinear fashion.
- F. Where conflicts or potential conflict exists and engineering guidance is desired, submit sketch of proposed resolution to Commissioner for review and approval.

1.8 MEASUREMENTS

- A. Contractor must base all his measurements, both horizontal and vertical from established benchmark. All work must agree with these established lines and levels. Contractor must verify all measurements at site; and check the correctness of same as related to the work.

1.9 MATERIALS AND WORKMANSHIP

- A. Materials must be new, meet detailed requirements of the Contract Documents and be identifiable as being specified or substitute products.
- B. Materials which do not conform to the requirements of the Contract Documents, are not equal to approved samples or are unsatisfactory or unsuited to the purpose for which they are intended, will be rejected.
- C. All work must be performed in the best and most workmanlike manner by plumbers and mechanics skilled in their respective trades and properly licensed.
- D. All equipment must be installed in accordance with the recommendation of the manufacturer.
- E. Checking and testing equipment by trade subcontractors and manufacturer's representative
- F. All equipment must be installed in strict accordance with manufacturer's instructions. During construction request supervisory assistance from equipment manufacturer's representatives so the equipment will be correctly installed. After installation, request the Commissioner to inspect and see the equipment is in proper working order.
- G. Manufacturer's representative must review the overall system design relative to the proper application of his equipment in the particular system. Contractor must note conduit, wiring,



control, location, and other relevant relationships, and furnish appurtenances necessary for satisfactory operation.

- H. Submit to the Commissioner a signed statement certifying:
 - 1. The equipment is properly installed and ready for operation
 - 2. The City of New York's maintenance representatives have been thoroughly instructed
 - 3. Maintenance and operation manuals issued and accepted by the Commissioner.

1.10 TEMPORARY FACILITIES

- A. Temporary Heating: Temporary heating must be as specified in Addendum to General Conditions
- B. Temporary Light and Power: Provided under Division 26.
- C. All temporary facilities must be removed at completion of project.

1.11 SHOP DRAWINGS

- A. Definitions:
 - 1. Shop Drawings are information prepared by the Contractor to illustrate portions of the work in more detail than shown in Contract Documents.
 - 2. Coordination Drawings are detailed, large scale layout Shop Drawings showing HVAC, Electrical, Plumbing and Fire protection work superimposed in order to identify conflicts and ensure inter-coordination of Mechanical, Electrical, Architectural, Structural and other work.
- B. Indoor Air Quality Requirements: Provide for all field-applied adhesives, sealants (used as fillers), and paints:
 - 1. Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, paints and coatings applied on the interior of the building. 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).

1.12 FIELD ADJUSTMENTS TO AIR HANDLING EQUIPMENT

- A. Contractor must be responsible for changing or adjusting belts, drives, pulleys, motors, impellers, etc., as required, by adjustment for acoustic performance, and by balancing company to achieve the desired air and water delivery by all air handling equipment.

1.13 COOPERATION BETWEEN TRADES

- A. Cooperate with all other Divisions performing work on this project as necessary to achieve a complete neatly fitted installation for each condition. Consult the Drawings and Specifications to determine nature and extent of work specified in other Divisions that adjoins or attaches to the work of this Division. Confer with other Divisions at the site to coordinate this work with theirs in view of job conditions to the end that interferences may be eliminated



and that maximum head room and clearance may be obtained. In the event that interferences develop, the Commissioner's Representative's decision will be final as to which Division must relocate its work, and no additional compensation will be allowed for the moving of piping, ductwork, conduit, or equipment, to clear such interferences. Provide templates, information, and instructions to other divisions to properly locate holes and openings to be cut or provided.

- B. For Testing and Balancing of the system, ensure full co-ordination between the subcontractor and all other Trades to achieve access to all system components, including leaving wall/ceiling sections down for access. Contractor must be responsible for pre-balancing checks and check sheet and responsibilities outlined in Section 230593
- C. Ensure full co-ordination between subcontractors to ensure the system is commissioned in accordance with the complete requirements of the complete contract documents.

1.14 HOIST, RIGGING, TRANSPORTATION AND SCAFFOLDING

- A. Provide all scaffolding, staging, cribbing, tackle hoist and rigging necessary for placing all materials and equipment in their proper places in the Project. All temporary work must be removed from the premises when its use is no longer required.

1.15 PRODUCT, DELIVERY, STORAGE AND HANDLING

- A. Deliver equipment in its original package to prevent damage or entrance of foreign matter. Perform all handling and shipping in accordance with manufacturer's recommendations. Provide protective coverings during construction.
- B. Identify materials and equipment delivered to Site to permit check against approved materials list, reviewed Shop Drawings.
- C. Completely cover motors and other moving machinery to protect from dirt and water during construction.
- D. Cap all openings in pipe and ductwork daily to protect against entry by foreign matter.
- E. Protect premises and Work of other Divisions from damage arising out of installation of Work of this Division.
- F. Perform Work in manner precluding unnecessary fire hazard.
- G. All ductwork must be delivered to site with all ends and openings capped with minimum of heavy gauge polyethylene sheeting taped all around to prevent ingress of moisture, dust, debris, etc.
- H. Protect from loss or damage. Replace lost or damaged materials and equipment with new at no increase in Contract Sum. Protect from damage, water, dust, etc., material, equipment and apparatus provided under this Division, both in storage and installed, until Notice of Completion has been filed. Provide temporary storage facilities for material and equipment. Material, equipment or apparatus damaged because of improper storage or protection will be rejected. Remove from Site and provide new, duplicate material, equipment or apparatus in replacement of that rejected.



- I. All stock piled conduit and piping must be placed on dunnage, and protected from weather and from entry of foreign material. All stored materials and equipment must be carefully inspected prior to installation and replaced with new material or equipment if found to be damaged, corroded, etc.

1.16 GUARANTEE AND 24-HOUR SERVICE

- A. Guarantee the Work of Division for one year following the date of Substantial Completion.
- B. Replace material and equipment that require excessive service during guarantee period as defined and as directed by Commissioner.
- C. Provide 24-hour service beginning on the date of substantial completion and lasting until the termination of guarantee period. Service must be at no cost to the City of New York.
- D. Provide manufacturer's engineering and technical staff at site to analyze and rectify problems that develop during guarantee period immediately. If problems cannot be rectified immediately to Commissioner's satisfaction, advise in writing, describe efforts to rectify situation, and provide analysis of cause of problem. Commissioner will suggest course of action.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Refer to each specific Mechanical and Electrical Section for details.

2.2 MATERIALS

- A. Equipment and materials must be as described in the respective Sections of Division 23 and Division 26 and as shown.
- B. Equipment specified by manufacturer's number must include all accessories, controls, listed in catalog as standard with equipment. Furnish optional or additional accessories as specified.
- C. Equipment, material damaged during transportation, installation, operation is considered as totally damaged. Replace with new. Variance from this permitted only with written acceptance.
- D. All items of materials in each category of equipment must be of one manufacturer.
- E. Material and Equipment—General Requirements:
 1. New.
 2. Testing agency labeled or with other identification wherever standards have been established.
 3. Comprised to render complete and operable systems; provide additional items needed to complete installation to realized design.
 4. Compatible with space allocated. Modifications necessary to adjust items to space limitations at Contractor's expense.
 5. Installed fully operating and without objectionable noise or vibration.



2.3 FLAME-SPREAD AND SMOKE-DEVELOPED PROPERTIES OF MATERIALS

- A. All materials and adhesives used throughout the mechanical systems must have a flame spread rating not over 25 without evidence of continued combustion and with a smoke-developed rating not higher than 50. Materials include but not limited to are insulation, acoustical lining, filter, ducts, flexible connections, jackets or coverings regardless of kind. If such materials are to be applied with adhesives and the adhesives used must have a flame-spread rating not over 25 and a smoke developed rating not higher than 50.
- B. "Flame Spread Rating" and "Smoke Developed Rating" will be as determined by the "method of test of surface burning characteristics of building materials, NFPA no. 244, ASTM E84, Underwriters' Laboratories, Inc., Standard." Such materials are listed in the Underwriters' Laboratories, Inc., "Building Materials List" under the heading "Hazard Classification (Fire)."

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 SPECIAL RESPONSIBILITIES

- A. Cooperate and coordinate with work of other Sections in executing work of this Section.
 - 1. Perform work such that progress of entire project including work of other Sections must not be interfered with or delayed.
 - 2. Provide information as requested on items furnished under this Section which must be installed under other Sections.
 - 3. Obtain detailed installation information from manufacturers of equipment provided under this section.
 - 4. Obtain final roughing dimensions or other information needed for complete installation of items furnished under other Sections.
 - 5. Keep fully informed as to shape, size and position of openings required for material or equipment to be provided under this and other Sections. Give full information so that openings required by work of this Section may be coordinated with other work and other openings and may be provided for in advance. In case of failure to provide sufficient information on proper time, provide cutting and patching or have same done, at own expense and to full satisfaction of Commissioner.
 - 6. Provide information as requested as to sizes, number and locations of housekeeping pads necessary for floor mounted vibrating and rotating equipment provided under this Section.
 - 7. Notify Commissioner of location and extent of existing piping, conduit, ductwork and equipment that interferes with new construction. In coordination with and with approval of Commissioner, relocate piping, ductwork and equipment to permit new work to be provided as required by Contract Documents. Remove non-functioning and abandoned piping, ductwork and equipment as directed by Commissioner. Dispose of or store items as requested by Commissioner.
- B. Maintenance of equipment and systems: Maintain equipment and systems until Final Acceptance. Ensure adequate protection of equipment and material during delivery, storage,



installation and shutdown and during delays pending final test of systems and equipment because of seasonal conditions.

- C. Use of premises: Use of premises will be restricted as directed by Commissioner and as required below:
1. Remove and dispose of dirt and debris and keep premises clean. During progress of work, remove equipment and unused material. Put building and premises in neat and clean condition and do cleaning and washing required to provide acceptable appearance and operation of equipment, to satisfaction of Commissioner.
 2. Store materials in a manner that will maintain an orderly clean appearance. If stored on-site in open or unprotected areas, all equipment and material must be kept off the ground by means of pallets or racks and covered with tarpaulins.
 3. Do not interfere with function of existing sewers and water and gas mains, electrical or mechanical systems and services. Extreme care must be observed to prevent debris from entering pipe, ductwork and equipment. Confer with Commissioner as to disruption of services or other utilities due to testing, connection of new work to existing. Interruption of services must be performed at time of day or night deemed by Commissioner to provide minimal interference with normal operation. Obtain Commissioner's approval of the method proposed for minimizing service interruption.
- D. Surveys and Measurements:
1. Base measurements, both horizontal and vertical, on reference points established by Contractor and be responsible for correct laying out of work.
 2. In event of discrepancy between actual measurements and those indicated, notify Commissioner in writing and do not proceed with work until written instructions have been issued by Commissioner.
- E. Fireproofing:
1. Clip, hangers, clamps, supports and other attachments to surfaces to be fireproofed must be installed, insofar as possible prior to start of spray fiber work.
 2. Ducts, piping and other items which would interfere with proper application of fireproofing must be installed after completion of spray fiber work.
 3. Patching and repairing of fireproofing due to cutting or damaging to fireproofing during course of work specified under this section must be performed by installer of fireproofing and paid for by the trade responsible for damage and must not constitute grounds for an extra to the City of New York.
- F. Temporary Utilities:
1. Coordinate work under this Section with progress of construction so that permanent heating system will be ready for temporary heating if permitted by Commissioner as soon as the building is closed in.
 2. Provide and direct labor required for attendance, operation and final restoration of permanent heating system if used for temporary heating purposes. Continuous direct attendance must be provided whenever permanent system is in operation prior to acceptance of permanent heating system by Commissioner.
- G. Air bound Systems: If, after the plant is in operation, any piping systems, coils or other apparatus are stratified or air bound (by vacuum or pressure), they must be re-piped with new approved and necessary fittings, air vents, or vacuum breakers at no extra cost. If connections are concealed in furring, floors or ceilings, this trade must bear the cost of tearing up and



refinishing construction and finish, leaving same in as good condition as before it was disturbed.

- H. Miscellaneous: Unload materials and equipment delivered to site. Pay cost for rigging, hoisting, lowering and moving electrical equipment on and around site, in building or on roof.

3.3 MATERIALS AND WORKMANSHIP

- A. Work must be neat and rectilinear. Ductwork, piping, conduit, etc. must run concealed except in mechanical rooms and areas where no hung ceiling exists. Install material and equipment as required by manufacturers. Installation must operate safely and without leakage, undue wear, noise, vibration, corrosion or water hammer. Work must be properly and effectively protected, and pipe and duct openings must be temporarily closed to prevent obstruction and damage before completion.
- B. Except as specified otherwise, material and equipment must be new. Provide supplies, appliances and connections necessary for complete and operational installation. Provide components required or recommended by OSHA and applicable NFPA documents.
- C. Finish of materials, components and equipment must be as approved by Commissioner and must be resistant to corrosion and weather as necessary.

3.4 CONTINUITY OF SERVICES

- A. Do not interrupt existing services without Commissioner's approval.
- B. Schedule interruptions in advance, according to Commissioner's instructions. Submit, in writing, with request for interruption, methods proposed to minimize length of interruption.
- C. Interruptions must be scheduled at such times of day and work so that they have minimal impact to the City of New York's operations.
- D. Coordinate any shutdowns of existing systems as follows:
 - 1. Give proper notice to Commissioner when making shutdowns; a minimum of fourteen full days are required.
 - 2. Minimize shutdowns of any system.
 - 3. Provide temporary services where required and perform shutdown and tie-ins at a time convenient to Commissioner.
 - 4. Perform required survey and inspection work required by the notice for shutdown.
- E. Include premium time work associated with interruption of services and/or shutdown as necessary to avoid disruption to the City of New York's operations.

3.5 WELDING

- A. Weld only by approved acetylene or electric welding process and welders must hold certification acceptable to the Commissioner.
- B. Conduct tests to demonstrate suitability of procedures to be used in making welds which conform to specified requirements.



- C. Specification for welding procedure must meet requirements of Welding Qualifications, Section IX, ASME Boiler and Pressure Vessel Code and ANSI B31.1.
- D. Align components. No part of pipe must be offset more than 20% of thickness. Set flanges and branches properly.
- E. Welder qualification:
 - 1. Test welders to demonstrate ability to make acceptable welds. Tests conducted for qualification of welder for work under one Division or Section must not qualify welder for work under another Division or Section.
 - 2. Tests must be as prescribed for welder qualification in Section IX of the ASME Code.
 - 3. Records of such tests must be as follows: Each welder must be assigned an identifying number, letter or symbol. Identifying mark must be stamped adjacent to welds made by this welder. Identification must be at top of horizontal piping and at front of vertical piping.
 - 4. Maintain record of welders employed, showing dates and results of tests and identifying mark assigned to each welder. Certify records and make them accessible to the City of New York's project representative. Before completion of project, one copy of records must be turned over to Commissioner.
 - 5. No qualification must be older than three years when welder commences to work on this project. If the welder has not welded in required welding process for a period of six months, he must be re-certified.
- F. Welding Tests
 - 1. As designated by Commissioner, remove welds for destructive testing or for testing by non-destructive means.
 - 2. If, in Commissioners opinion, welds so tested do not meet requirements of Sections VIII and IX of ASME, then the contractor must pay for costs of the tests. Remove welds welded by that welder at no cost to the City of New York. Rewelding must be performed by qualified welder other than welder whose weld did not pass the test. Welders whose welds were defective must not be employed on site for remainder of the project.
 - 3. Welding of stanchions, brackets, anchors and other welding not performed on pipe joints must be in accordance with requirements of AWS specifications and requirements.

3.6 ACCESS AND ACCESS PANELS

- A. Access panels must be provided where indicated on drawings. Include allowance for 24x24 access panels in sheetrock ceilings for ceiling mounted equipment.
- B. Provide proper access to materials and equipment that require inspection, replacement, repair or service, and coordinate their delivery with the installing Trade. If proper access cannot be provided, confer with Commissioner as to the best method of approach for minimizing effect of reduced access which may result.
- C. Coordinate and prepare a location, size, and function schedule of access panels required to fully service equipment and deliver to a representative of installing Trade. Furnish and install distinctively colored buttons (color as selected by Commissioner) in finished ceiling to identify all access panels.



- D. Furnish access panels for installation under other Sections where fire dampers, volume dampers, controls, shut-off valves, control valves, check valves, or other items installed under this section require access and are concealed in floor, wall, furred space or above ceiling. Access panels must be by Milcor, Knapp, Nystorm or Inlanf Steel; coordinate selection with other Section supplying similar access panels
- E. Ceilings consisting of lay-in or removable splined tiles do not require access panels and dampers, splitters, or test hole openings above ceiling must have location marked with thumb tack on finished ceiling panel. Location must be noted on record drawings.
- F. Access panels must have same fire rating classification as surface penetrated
- G. Panels must be at least 8"x8"; access panels at equipment (valves, fire dampers).

3.7 PENETRATIONS AND SLEEVES

A. General

- 1. Layout penetration and sleeve openings in advance to permit provision in work. Set sleeves and conduit in forms before concrete is poured. Provide remedial work where sleeves and conduits are omitted or improperly placed.
- 2. Provide sleeves and packing materials at all penetrations of foundations, walls, slabs (except on grade), partitions and floors. Sleeves must meet NFPA 101 requirements and material requirements of these specifications.
- 3. Sleeves that penetrate outside walls, basement slabs, footings and beams must be waterproof.
- 4. Coordinate work carefully with architectural and structural. Set sleeves in forms before concrete is poured. Provide core drilling as necessary if walls are poured, or otherwise constructed, without sleeves and a wall penetration is required. Provide core drilling as required for penetration of existing construction. Do not penetrate structural members without Commissioner's approval.
- 5. Sleeves for insulated pipe and duct in no-fire rated construction must accommodate continuous insulation without compression. Sleeves and/or penetration in fire rated construction must be packed with fire rated material which must maintain the fire rating of the wall. Seal ends of penetrations to provide continuous vapor barrier where insulation is interrupted.
- 6. Where pipes passing through openings are exposed in finished rooms, finishes of filling materials must match and be flush with adjoining floor, ceiling, and wall finishes.
- 7. Identify unused sleeves and slots for future installation.
- 8. Fill slots, sleeves and other openings in floors and walls not used. Fill spaces in openings after installation of pipe, duct, conduit or cable.
- 9. Fill for floor penetration must prevent passage of water, smoke, fire, and fumes. Fill must be fire resistant in fire floors and walls, and must prevent passage of air, smoke and fumes.
- 10. Sleeves through floors must be watertight and must extend 2" above floor surface.

B. Pipe and Conduit Sleeves:

- 1. Annular space between pipe/conduit and sleeve must be at least 1/4".
- 2. Sleeves are not required for slabs-on-grade unless otherwise noted on plans.
- 3. Sleeves and packing materials, through rated firewalls and smoke partitions must maintain fire rating of construction penetrated.



4. Do not support piping risers or conduit on sleeves.
- C. Duct Sleeves and Prepared Openings:
 1. Provide duct sleeves for round ducts 15” and smaller; provide prepared, framed openings for round ducts larger and for square, rectangular and flat oval ducts, except as otherwise specified otherwise. Sleeves must meet SMACNA requirements.
 2. Provide sleeves for ducts through 1-, 2- or 3- hour fire rated construction and smoke partitions, regardless of size or shape of ducts. Sleeves must maintain fire rating of construction penetrated. Sleeve and seal materials, construction and clearances must meet requirements of SMACNA Fire Damper and Heat Stop Guide for Air Handling Systems.
 3. Prepared openings must be framed to provide 1” clearance between framing and duct or duct insulation.
- D. Installations, Testing and Approvals:
 1. Installation must meet manufacturer’s recommendations exactly, particularly regards to safety, ventilation, removal of foreign materials and other details of installation. Dam openings as recommended. Remove flammable materials used for damming and forming seals in fire rated construction.
 2. Sleeve penetration methods must be water- and gas- tight and must meet requirements of ASTM 119 Standard Methods of Fire Tests of Building Construction and Materials.
 3. Fire-stop penetration seal methods and materials must be FM-approved and UL-listed as applicable. They must have same rating as the structure penetrated. Submit manufacturer’s detail sheet indicating assembly rating.
 4. Inspect foamed sealants to ensure manufacturer’s optimum cell structure and color ranges.
 - 5.

3.8 ANCHORS AND INSERTS

- A. Inserts must be iron or steel of type to receive machine bolt head or nut after installation. Insert must permit adjustment of bolt in one horizontal direction and must develop strength of bolt when installed in properly cured concrete.
- B. Provide anchors as necessary for attachment of equipment support and hangers.

3.9 ESCUTCHEONS

- A. Install escutcheons around exposed pipe passing through finished floor, floor, wall, or ceiling. Escutcheons must be heavy cast brass, chromium plated, adjustable, and of sufficient outside diameter to cover sleeve opening and must fit snugly around pipe and flush against floor or wall surface. Escutcheon plates must be provided on pipes at fixtures and must be polished chrome plated. Plated steel escutcheon plates are not acceptable. Sample escutcheon plates must be submitted to the Commissioner for approval prior to installation.

3.10 CORE DRILLING

- A. Core drilling is to be avoided.
- B. Set sleeves prior to installation of structure for passage of pipes, conduits, ducts, etc.



- C. Where core drilling is unavoidable, or required by renovation projects, locate all required openings prior to coring and submit to Commissioner for review.
- D. Coordinate openings with all other trades.
- E. Core drilling if required is to be provided by the general construction trade. All core drilling location must be approved by the Commissioner.
- F. Do not disturb existing systems.
- G. Thoroughly investigate existing conditions in vicinity of opening prior to coring.

3.11 CARPENTRY, CUTTING AND PATCHING

- A. Do not cut or drill structural members without consent of Commissioner.

3.12 EXCAVATING & BACKFILLING

- A. Preparation:
 - 1. In accordance with the requirements of Division 2.
 - 2. Provide barricades, signs, lanterns, shoring, sheeting and pumping as part of Work in this Division as required to ensure safe conditions.
 - 3. Dig trenches straight, true to line and grade with sides and bottoms smoothed of any rock points. Excavate 6 inches below grade of pipe, fill with sand properly packed. Support pipe for entire length on packed sand. Shape or pack bottom of trenches for pipe, duct fittings, hubs, couplings, etc., using templates to fit outside periphery of lower third of piping and ductwork. Provide piping outside building with 36 inch minimum cover from top of pipe to finished grade. Minimum width 26 inches.
 - 4. Dispose of all surplus excavation material and seepage water as directed.
 - 5. Backfill.
 - 6. After piping has been installed, tested and approved, backfill all excavation, tamp and compact by compressed air tampers.
 - 7. Backfill to 6 inches above crown of pipe with unwashed sand, with remainder of trench back-filled and mechanically tamped in 6 inch maximum layers of selected excavated materials, free from organic matter, rocks, etc. Provide 90 percent compaction in accordance with ASTM D 1557-58T; 95 percent compaction for trenches below building slabs.
 - 8. In any asphalt or concrete paved areas, backfill only to subgrade level.
 - 9. When piping is installed, and prior to backfilling, advise Commissioner. Do not backfill without acceptances of Commissioner.
 - 10. Replace to original condition all paving, curbs, gutters, walks, etc., which become disturbed by trenching.

3.13 VIBRATION CONTROL

- A. Design criteria for all the Work of Division 23 are specified in Section 230548.

3.14 CONCRETE EQUIPMENT BASES



- A. Locate and size concrete base for all equipment located on existing floors. Base: Six inches high and extending six inches beyond edge of equipment base unless indicated otherwise. Ensure equipment elevation is suitable for gravity drainage where relevant.

- B. Coordinate concrete bases; concrete is specified in Division 3.

3.15 WATERPROOF CONSTRUCTION

- A. Maintain waterproof integrity of penetrations of materials intended to be waterproof. Provide flashing at exterior wall and roof penetrations. Caulk watertight penetrations of foundation walls and floors. Provide membrane clamps at penetrations of waterproof membranes.
- B. Provide galvanized sheet metal weather protection canopies, hoods or enclosures over all out-of-doors equipment, the operation or maintenance of which would be impaired by rainwater. This requirement applies to damper operators and bearing, damper motors, controls, and instruments. See other paragraphs in this Division for application of this requirement to motors, drive, ducts, and fans.

3.16 RESTORATION OF DAMAGE

- A. Repair or replace, as directed by Commissioner, materials and parts of premises which become damaged as result of installation of Work of this Division. Remove replaced parts from premises.

3.17 LINTELS

- A. Where openings break into an already completed wall as a result of a failure to set sleeves or provide openings during erection of the wall, provide lintels as required for the support of building construction above the inserted item.
- B. Lintels must be structural steel angles, channels or tees of proper size and sections for the supported load; submit to the Commissioner with supporting calculations for approval prior to the installation.
- C. Where new openings are required in an existing wall co-ordinate opening size, location and lintel type with the Commissioner.

3.18 ROOF OPENINGS AND CURBS

- A. Roof openings where required must be coordinated with all affected Trades and all flashing and patching must be as per details indicated on the Architectural plans.

3.19 TOOLS AND EQUIPMENT

- A. Furnish all tools and equipment necessary for the proper installation, protection and upkeep of the Work.

3.20 ADJUSTMENT

- A. Preliminary Operation:



1. Operate any portion of installation for the Commissioner's convenience if so requested by Commissioner. Such operation does not constitute acceptance of Work as complete.
- B. Startup Service:
 1. Prior to startup, ensure that systems are ready, including checking the following: proper equipment rotation, proper wiring, auxiliary connections, lubrications, venting fan balance, controls and installed and properly set relief and safety valves.
- C. Start and operate all systems. Provide services of factory instructed technicians for startup of major equipment and systems including air handling units, exhaust fans and energy recovery units.
- D. Adjusting:
 1. Adjust all equipment and system components as shown or as otherwise required to result in intended system operation.
 2. Thereafter, as a result of system operation or as directed by Commissioner, make readjustments as necessary to refine performance and to effect complete system "tune-up".
 3. After completion of testing and adjustment, operate the different systems and equipment under normal working conditions for 72 hours continuously and show specified performance. If, in the opinion of the Commissioner, performance of equipment or systems is not in accordance with specifications or submitted data, alter or replace equipment at no increase in Contract Sum. Contractor, at his option, may order tests from an independent approved laboratory to prove compliance. All such tests must be at no increase in Contract Sum. Repeat process as often as required.
 4. At completion of Work, provide written certification that all systems are functioning properly without defects.
- E. Noise:
 1. Cooperate in reducing any objectionable noise or vibration caused by mechanical systems to the extent of adjustments to specified and installed equipment and appurtenances.
 2. Cooperate in adjustment of mechanical systems and terminal devices, as directed by Commissioner, to obtain specified acoustic properties.
 3. Completely correct noise problems caused by failure to make installation in accordance with Contract Documents, including labor and materials required as a result of such failure, at no increase in Contract Sum.

3.21 INSTALLATION OF EQUIPMENT

- A. Use printed descriptions, specifications and recommendations of manufacturers as a guide for installation of Work.
- B. Assemble equipment required to be field assembled under the direct supervision of the manufacturers' agent. Prior to the final acceptance submit letters from the manufacturers that this has been done.
- C. Avoid interference with structure and with work of other trades, preserving adequate headroom and clearing doors and passageways, to satisfaction of Commissioner and in



accordance with code requirements. Installation must permit clearance for access to equipment for repair, servicing and replacement.

- D. Install equipment to properly distribute equipment loads on building structural members provided for equipment support under other Sections. Roof mounted equipment must be installed and supported on structural steel provided under other Sections.
- E. Provide suspended platforms, strap hangers, brackets, shelves, stands or legs as necessary for floor, wall or ceiling mounting of equipment as required.
- F. Provide steel supports and hardware for proper installation of hangers, anchors, etc.
- G. Provide cuts, weights, and other pertinent data required for proper coordination of equipment support provisions and installations.
- H. Structural steel and hardware must conform to Standard specifications of ASTM; use of steel and hardware must conform to requirements of Section V of Code of Practice of American Institute of Steel Construction.
- I. Verify site conditions and dimensions of equipment to ensure access for proper installation of equipment without disassembly. Report in writing to Commissioner, prior to purchase or shipment of equipment involved, on conditions which may prevent proper installation.

3.22 ELECTRICAL REQUIREMENTS

- A. Electrical Work in this Division must conform to requirements of Division 26.
- B. Provide all motors, starters, variable frequency drives, disconnects for motors, contactors for heating coils and controls for equipment under this section, unless otherwise noted.
- C. Provide all necessary conduit and control wiring to pushbuttons, thermostats, pilot lights, interlocks and similar equipment for equipment under this Division.
- D. Flow control switches, thermostats, controllers, relays, transformers, switches, etc and other components provided with equipment shown on the Contract Documents not to be factory wired or part of division 26 scope necessary for proper operation of mechanical systems must be furnished and installed by Contractor.
- E. Where the starter and/or safety switch is an integral part of equipment assembly, the assembly must be furnished with the wiring complete between starter, controller and motor. Make connections to unit terminals.
- F. Factory wired assemblies and panels: Pre-wired to numbered terminal strips for connection to field wiring. Provide disconnect switch for each control circuit connection to pre-wired assemblies and control panels.
- G. All motor control centers (MCCs) must be provided and installed by the Contractor. If providing MCCs for specific motors, do not furnish starter for those specific motors. However, coordinate with the starter requirements to ensure proper operation of those motors.



- H. All motors and motor control equipment must meet the requirements of NEC.
- I. Verify voltage at site before ordering any electrical equipment.
- J. Wiring:
 - 1. Power wiring: Except for factory wiring on mechanical equipment, power wiring is specified in Division 26.
 - 2. HVAC control wiring:
 - a. Except for factory wiring on mechanical equipment, specified in Division 26.
 - b. All wiring and conduit must be according to latest edition of the NEC. All control wiring must be installed in EMT in accordance with applicable portions of NEC and requirements of Division 26.
 - c. Low voltage wiring in air plenums must be UL approved conductor for application.
- K. Provide weatherproof devices and installation for out-of-doors work.
- L. Smoke detectors: Product of combustion detectors in ductwork furnished to be coordinated with Division 26 for the fire alarm system.
- M. Motors:
 - 1. Provide motors for equipment specified. Separately shipped motors, variable frequency drives, starters, disconnects are to be field installed.
 - 2. Adjustable motor bases and all bolts and nuts required for installation of base and motor must be provided.
 - 3. Align and adjust mechanical coupling for direct-driven motorized equipment. Adjust and align drive and belt tension on belt-driven equipment.
 - 4. Field lubricate all motors prior to operation and maintain lubrication prior to acceptance of equipment by the Commissioner.
 - 5. Motor terminal connection must follow motor manufacturer's installation instructions.
 - 6. Check for proper rotation of three phase equipment.

3.23 PAINTING

- A. Equipment installed must have shop coat of non-lead gray paint. Hangers and supports must have one coat of non-lead primer. Machinery such as pumps, fans, etc., must be stenciled with equipment name. Stencil must be at least 6" high for large equipment, 2" high for small equipment. Finish painting, including painting of various piping and duct systems, must be done under other Sections.
- B. Paint all outside exposed equipment and equipment supports with two coats of weather resistant enamel.
- C. Provide heat resistant paint for hot piping, equipment and materials.
- D. Note requirement for Commissioner's approval invoked under paragraph MATERIALS AND WORKMANSHIP regarding finish of material and equipment, which are visible or subject to corrosive or atmospheric conditions.
- E. Properly prepare Work under this Division to be finish painted under Division 9.



3.24 LUBRICATION

- A. Lubricate all equipment at completion of Work. Furnish Commissioner with a written lubrication schedule for all equipment.

3.25 EXPANSION PROVISIONS

- A. Installation of piping must allow for expansion using offsets, loops, swing joints, expansion joints, etc. as necessary to prevent undue stress. Take-offs from mains to run outs must not have less than three elbow swing.
- B. Mains and risers with loops or offsets must be securely anchored to structure so as to impart expansion towards loops or offsets. Anchors must be constructed of heavy forged wrought iron, secured to pipe and to structure. Provide vibration isolation as required.
- C. Provide pipe alignment guides as required to guide expanding pipe to move freely from anchor points toward expansion joints, offsets, etc.

3.26 CLEANING

- A. Cleaning must be performed prior to testing.
- B. Completely cover all plumbing fixtures and all motors and other moving machinery to prevent entry of dirt and water during construction. Effectively cap all openings into ducts and pipes to keep foreign matter out during construction.
- C. Protect all finished surfaces of fixtures with heavy paper pasted thereon, or by other means, throughout the period of construction.
- D. Ductwork:
 - 1. Ducts must be thoroughly cleaned so that no dirt or dust must be discharged from diffusers, registers or grilles, when system is operated.
 - 2. Provide temporary connections for cleaning. Provide cheesecloth for openings during cleaning.
 - 3. Replace filters prior to final inspection and testing.
- E. Piping
 - 1. Furnish pipe cleaning chemicals, chemical feed equipment, materials and labor necessary to clean pipe.
 - 2. Permanently install necessary chemical injection fittings complete with stop valves.
 - 3. After all piping systems have been pressure tested and approved for tightness, clean and flush piping as specified.
 - 4. Maintain continuous blowdown and make-up, as required during flushing operation.
- F. Equipment
 - 1. After completion of project, clean exterior surface of all equipment, including concrete residue, dirt, paint residue, etc.
 - 2. Plumbing fixtures - clean and polish fixtures immediately prior to final inspection.

END OF SECTION 23 05 00



THIS PAGE INTENTIONALLY LEFT BLANK

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. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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 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 may 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 Applicable)

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 PERFORMANCE REQUIREMENTS

- A. Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer licensed in State of NY, using performance requirements and design criteria indicated.
 - 1. Design supports for multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.
 - 2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.7 WARRANTY

- A. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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. 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. These fasteners may be used with prior written approval from Commissioner.
- B. 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. 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 will accommodate up to 2 1/2" pipe (inside diameter) or up to 3" (outside diameter) pipes.
- B. 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 16, 18 or 20 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: Nonstaining, 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 in Division 09
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to restore and 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.
 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



SECTION 23 05 48 - VIBRATION AND SEISMIC 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. Spring isolators.
 - 3. Elastomeric hangers.
 - 4. Spring hangers.

1.3 SUBMITTALS 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 calculations and details indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the professional engineer licensed in State of NY 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".
- B. Comply with seismic-restraint requirements in the 2104 NYC Building Code unless requirements in this Section are more stringent.
- C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.6 PERFORMANCE REQUIREMENTS

- A. Wind-Restraint Loading:
 - 1. Basic Wind Speed: 98 miles per hour
 - 2. Building Classification Category: Design Category B
 - 3. Minimum 10 lb/sq. ft. multiplied by the maximum area of the HVAC component projected on a vertical plane that is normal to the wind direction, and 45 degrees either side of normal.



1.7 WARRANTY

- A. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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. Amber/Booth Company, Inc.
 - 2. Kinetics Noise Control.
 - 3. Mason Industries.
 - 4. Vibration Eliminator Co., Inc.
 - 5. Vibration Mountings & Controls, Inc.
 - 6. Eaton
 - 7. Or approved equal
- B. Metal Waffle Pads (MWP): Arranged in multiple layers of sufficient stiffness for uniform loading over pad area, molded with a non-slip pattern sandwiching stainless steel –shim plates, and factory cut to sizes that match requirements of supported equipment. Minimum 5/16 inch thick pads, 12.5% strain, bridge bearing quality with durometer (Shore A scale) of 50.
 - 1. Resilient Material: Oil- and water-resistant neoprene.
 - 2. If the isolator is bolted to the structure, a neoprene vibration isolation washer and sleeve (Uniroyal Type 620/660, or as approved) must be installed under the bolt head between the steel washer and the base plate.
- C. Cushion clamps (VC): Cushion clamp is designed for use with refrigeration lines, HVAC, copper tubing. It provides an energy-absorption barrier between the lines and the mounting material and remains flexible thru its entire service range of -75°F to +375°F. This elastomer allows for expansion and contraction within the mounting system and prevents galvanic reaction between dissimilar metals.
- D. Spring Isolators (SI): Freestanding, steel, open-spring isolators with seismic restraint.
 - 1. Housing: Steel with resilient vertical-limit stops to prevent spring extension due to weight being removed; factory-drilled baseplate bonded to 1/4-inch- (6-mm-) thick, neoprene or rubber isolator pad attached to baseplate underside; and adjustable equipment mounting and leveling bolt that acts as blocking during installation.
 - 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.



- E. 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%.
- F. 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 INSTALLATION

- A. General
 - 1. Comply with requirements for installation of roof curbs, equipment supports, and roof penetrations.
 - 2. Level vibration isolated equipment under rated design operating conditions while maintaining the isolation criteria. Isolators must be plumb and aligned to preclude misalignment or undesired contact during operation
- B. Equipment Restraints:
 - 1. Install resilient bolt isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch (3.2 mm).
- C. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.
- D. Drilled-in Anchors:



1. Identify 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 inspections.
- B. Inspections:
 1. After the entire installation is complete, and under full operational load, the isolators must be adjusted so that the load is transferred from the block to the isolators. Ensure all debris from beneath the equipment the equipment and verify there are no short circuits of the isolation. The equipment must be free in all directions.
 2. Measure isolator restraint clearance.
 3. Measure isolator deflection.

3.4 ADJUSTING

- A. Adjust active height of spring isolators.
- B. Adjust restraints to permit free movement of equipment within normal mode of operation.

3.5 HVAC VIBRATION-CONTROL DEVICE SCHEDULE

- A. Supported or Suspended Equipment:

Item / Equipment	Location & Mounting	Isolation Type	Min. Static Deflection
Exhaust Fan	Ceiling Hung	SI	1 inch
Energy Recovery Ventilator	Ceiling Hung	SI	1 inch
VRV Condensing Units	Concrete Pad	MWP	0.35 inch
Heat Recovery (Branch Selector)	Ceiling Hung	NH	0.5 inch
Indoor AC Units	Ceiling Hung	NH	0.5 inch
Refrigerant Piping	Cushion clamps throughout.	-	-

END OF SECTION 23 05 48

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. Pipe labels.
 - 4. Duct labels.

1.3 SUBMITTALS PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTAL

- 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 shall provide warranty for a period of one year from substantial completion. Warranty shall 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 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.

2.2 WARNING SIGNS AND LABELS

- A. Shop Drawing: Show location and mockup of labels for font, size, layout.
- B. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
- C. Letter Color: Red.
- D. Background Color: White.
- E. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- F. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- G. 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.
- H. Fasteners: Stainless-steel rivets or self-tapping screws.



- I. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- J. 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. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- C. 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 high.

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 encapsulates.

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; maintenance spaces such as shafts 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 25 feet along each run. Reduce intervals to 15 feet in areas of congested piping and equipment.
 - 7. Refrigerant piping label must also include unit identification
- B. Pipe Label Color Schedule:
 - 1. Refrigerant Piping:
 - a. Background Color: Orange
 - b. Letter Color: Black.

3.5 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 25 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. Constant-volume air systems.
 - b. Modulating air systems
 - 2. Balancing Hydronic Piping Systems
 - a. Constant-flow hydronic 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 SUBMITTALS PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.5 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. 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.
- C. Certified TAB reports
- D. Post balancing reports indicated in section 3.13 and 3.14

1.6 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".



- B. TAB Contractor Qualifications: Engage a TAB entity certified by AABC or TABB.
 - 1. TAB Field Supervisor: Employee of the TAB contractor and certified by AABC or TABB.
 - 2. TAB Technician: Employee of the TAB contractor and who is certified by AABC 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 contractor's forms approved by Commissioner or Commissioning Authority.
- E. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

1.7 WARRANTY

- A. Contractor shall provide warranty for a period of one year from substantial completion. Warranty shall cover 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 (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, balancing valves and fittings, 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 of philosophies and assumptions about HVAC system and equipment controls.



- E. Examine ceiling plenums a used for supply, return, or relief air to verify that they meet the leakage class of connected ducts as specified in Division 23 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 and pump 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 indoor equipment such as indoor AC units, ceiling hung fans and verify that they are accessible, clearance for filter pull, local disconnect switch and their controls are connected and functioning.
- K. Examine strainers. Verify that startup screens are replaced by permanent screens with indicated perforations.
- L. Examine three-way valves for proper installation for their intended function of diverting or mixing fluid flows.
- M. Examine heat-transfer coils for correct piping connections and for clean and straight fins.
- N. Examine system pumps to ensure absence of entrained air in the suction piping.
- O. Examine operating safety interlocks and controls on HVAC equipment.
- P. 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. Hydronic systems are filled, clean, and free of air.



3. Automatic temperature-control systems are operational.
4. Equipment and duct access doors are securely closed.
5. Balance, smoke, and fire dampers are open.
6. Isolating and balancing valves are open and control valves are operational.
7. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
8. 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", ASHRAE 111, 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 Division 23 Section 23700 "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 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 Division 23 Section 233113 "Metal Ducts."

3.6 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 233416 and 237433 for air-handling units and fans for adjustment of fans, belts, and pulley sizes to achieve indicated air-handling-unit and fan 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.

3.7 PROCEDURES FOR MODULATING AIR SYSTEMS

- A. The procedure applies to toilet, dryer and kitchen exhaust system
- B. Adjust fan and associated variable frequency drive to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.
- C. Adjust pressure transducer set-point to maintain bathroom fans exhaust airflow within 10% of design flow at lowest possible pressure setting of the pressure transducers in coordination with factory trained technician.

3.8 GENERAL PROCEDURES FOR HYDRONIC SYSTEMS

- A. Prepare test reports with pertinent design data, and number in sequence starting at pump to end of system. Check the sum of branch-circuit flows against the approved pump flow rate. Correct variations that exceed plus or minus 5 percent.
- B. Prepare schematic diagrams of systems' "as-built" piping layouts.
- C. Prepare hydronic systems for testing and balancing according to the following, in addition to the general preparation procedures specified above:
1. Open all manual valves for maximum flow.
 2. Check liquid level in expansion tank.
 3. Check makeup water-station pressure gage for adequate pressure for highest vent.
 4. Check flow-control valves for specified sequence of operation, and set at indicated flow.
 5. Set differential-pressure control valves at the specified differential pressure. Do not set at fully closed position when pump is positive-displacement type unless several terminal valves are kept open.
 6. Set system controls so automatic valves are wide open to heat exchangers.
 7. Check pump-motor load. If motor is overloaded, throttle main flow-balancing device so motor nameplate rating is not exceeded.
 8. Check air vents for a forceful liquid flow exiting from vents when manually operated.



3.9 PROCEDURES FOR CONSTANT-FLOW HYDRONIC SYSTEMS

- A. Measure water flow at pumps. Use the following procedures except for positive-displacement pumps:
 - 1. Verify impeller size by operating the pump with the discharge valve closed. Read pressure differential across the pump. Convert pressure to head and correct for differences in gage heights. Note the point on manufacturer's pump curve at zero flow and verify that the pump has the intended impeller size.
 - a. If impeller sizes must be adjusted to achieve pump performance, obtain approval from Commissioner and comply with requirements in Division 23 Section 232123 "Hydronic Pumps."
 - 2. Check system resistance. With all valves open, read pressure differential across the pump and mark pump manufacturer's head-capacity curve. Adjust pump discharge valve until indicated water flow is achieved.
 - a. Monitor motor performance during procedures and do not operate motors in overload conditions.
 - 3. Verify pump-motor brake horsepower. Calculate the intended brake horsepower for the system based on pump manufacturer's performance data. Compare calculated brake horsepower with nameplate data on the pump motor. Report conditions where actual amperage exceeds motor nameplate amperage.
 - 4. Report flow rates that are not within plus or minus 10 percent of design.
- B. Measure flow at all automatic flow control valves to verify that valves are functioning as designed.
- C. Measure flow at all pressure-independent characterized control valves, with valves in fully open position, to verify that valves are functioning as designed.
- D. Set calibrated balancing valves, if installed, at calculated pre-settings.
- E. Measure flow at all stations and adjust, where necessary, to obtain first balance.
 - 1. System components that have Cv rating or an accurately cataloged flow-pressure-drop relationship may be used as a flow-indicating device.
- F. Measure flow at main balancing station and set main balancing device to achieve flow that is 5 percent greater than indicated flow.
- G. Adjust balancing stations to within specified tolerances of indicated flow rate as follows:
 - 1. Determine the balancing station with the highest percentage over indicated flow.
 - 2. Adjust each station in turn, beginning with the station with the highest percentage over indicated flow and proceeding to the station with the lowest percentage over indicated flow.
 - 3. Record settings and mark balancing devices.
- H. Measure pump flow rate and make final measurements of pump amperage, voltage, rpm, pump heads, and systems' pressures and temperatures including outdoor-air temperature.
- I. Measure the differential-pressure-control-valve settings existing at the conclusion of balancing.



- J. Check settings and operation of each safety valve. Record settings.

3.10 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.

3.11 PROCEDURES FOR BOILERS

- A. Hydronic Boilers: Measure and record entering- and leaving-water temperatures and water flow rate for each boiler.

3.12 PROCEDURES FOR CABINET HEATER AND UNIT HEATER

- A. Measure, adjust, and record the following data for each electric unit heater:
 - 1. Nameplate data.
 - 2. Airflow.
 - 3. Entering- and leaving-air temperature at full load.
 - 4. Voltage and amperage input of each phase at full load and at each incremental stage.
 - 5. Calculated kilowatt at full load.
 - 6. Fuse or circuit-breaker rating for overload protection.

3.13 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 10 percent.

3.14 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.



- B. Status Reports: Prepare biweekly progress reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.15 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 contractor.
 - 3. Project name.
 - 4. Project location.
 - 5. Architect of Record name and address.
 - 6. Engineer of Record 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. Fan drive settings including settings and percentage of maximum pitch diameter.
 - e. VFD settings for variable-air-volume systems.
 - f. Settings for supply-air, static-pressure controller.
 - g. 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. Water and steam flow rates.
 3. Duct, outlet, and inlet sizes.
 4. Pipe and valve sizes and locations.
 5. Terminal units.
 6. Balancing stations.
 7. Position of balancing devices.

3.16 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. Cellular glass.
 - b. Flexible elastomeric.
 - c. 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.
- B. Related Sections:
1. Section 23 31 13 "Metal Ducts" for duct liners.

1.3 SUBMITTALS PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: For each type of product indicated.
- C. Submittal: For adhesives and sealants, including printed statement of VOC content.
- D. 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.
6. Detail field application for each equipment type.

E. 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, by a testing and inspecting agency acceptable to NY City Dept. of Buildings. 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 shall provide warranty for a period of one year from substantial completion. Warranty shall 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. 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. Cellular Glass: Inorganic, incombustible, foamed or cellulated glass with annealed, rigid, hermetically sealed cells. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
1. Products: Subject to compliance with requirements, provide products by one of the following:
 - a. Cell-U-Foam Corporation; Ultra-CUF.
 - b. Pittsburgh Corning Corporation; Foamglas Super K.
 - c. Owens Corning
 - d. Or Approved Equal
 2. Block Insulation: ASTM C 552, Type I.
 3. Special-Shaped Insulation: ASTM C 552, Type III.
 4. Board Insulation: ASTM C 552, Type IV.
 5. Preformed Pipe Insulation without Jacket: Comply with ASTM C 552, Type II, Class 1.
 6. Preformed Pipe Insulation with Factory-Applied ASJ-SSL: Comply with ASTM C 552, Type II, Class 2.
 7. Factory fabricate shapes according to ASTM C 450 and ASTM C 585.
- G. Flexible Elastomeric: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials and Type II for sheet materials.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Aeroflex USA Inc.; Aerocel.
 - b. Armacell LLC; AP Armaflex.
 - c. RBX Corporation; Insul-Sheet 1800 and Insul-Tube 180.
 - d. Or Approved Equal
- H. 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, II with factory-applied vinyl jacket and III with factory-applied FSK jacket. 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.; SoftTouch Duct Wrap.
 - b. Johns Manville; Microlite XG
 - c. Knauf Insulation; Friendly Feel Duct Wrap.
 - d. Owens Corning; SOFTR Duct Wrap.
 - e. Or Approved Equal
- I. Mineral-Fiber Board Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 612, Type IA or Type IB. For duct and plenum applications, provide insulation with factory-applied ASJ and with factory-applied FSK jacket. For equipment applications, provide insulation with factory-applied ASJ and with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
1. Products: Subject to compliance with requirements, provide the following:
 - a. CertainTeed Corp.; CertaPro Commercial Board.
 - b. Johns Manville; 800 Series Spin-Glas.
 - c. Knauf Insulation; Insulation Board
 - d. Owens Corning; Fiberglas 700 Series.
 - e. Or Approved Equal
- J. Mineral-Fiber, Preformed Pipe Insulation:



1. Products: Subject to compliance with requirements, provide the following:
 - a. Johns Manville; Micro-Lok.
 - b. Knauf Insulation; 1000° Pipe Insulation.
 - c. Owens Corning; Fiberglas Pipe Insulation.
 - d. Or Approved Equal
2. Type I, 850 deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ-SSL. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
3. Type II, 1200 deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type II, Grade A, with factory-applied ASJ-SSL. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

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 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. Cellular-Glass, Phenolic, Polyisocyanurate, Adhesive: Solvent-based resin adhesive, with a service temperature range of minus 75 to plus 300 deg F.
 1. Products: Subject to compliance with requirements, provide the following:
 - a. Childers Products, Division of ITW; CP-96.
 - b. Foster Products Corporation, H. B. Fuller Company; 81-33.
 - c. Owen Corning
 - d. Or Approved Equal
 2. 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).
- C. Flexible Elastomeric Adhesive: Comply with MIL-A-24179A, Type II, Class I.
 1. Products: Subject to compliance with requirements, provide the following:
 - a. Aeroflex USA Inc.; Aeroseal.
 - b. Armacell LCC; 520 Adhesive.
 - c. Foster Products Corporation, H. B. Fuller Company; 85-75.
 - d. RBX Corporation; Rubatex Contact Adhesive.
 - e. Or Approved Equal
 2. 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).
- D. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
 1. Products: Subject to compliance with requirements, provide 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
 - 2. 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).
- E. ASJ Adhesive, and FSK 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 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
 - 2. 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).
- F. PVC Jacket Adhesive: Compatible with PVC jacket.
- 1. Products: Subject to compliance with requirements, provide 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. Speedline Corporation; Speedline Vinyl Adhesive.
 - e. Or Approved Equal
 - 2. 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).

2.4 MASTICS

- A. Materials must be compatible with insulation materials, jackets, and substrates; comply with MIL-C-19565C, Type II.
- 1. For indoor applications, use mastics that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Vapor-Barrier Mastic: Water based; suitable for indoor and outdoor use on below ambient services.
- 1. Products: Subject to compliance with requirements, provide 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 at 43-mil dry film thickness.



3. Service Temperature Range: Minus 20 to plus 180 deg F.
 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 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.

2.5 SEALANTS

- A. Joint Sealants:
1. Joint Sealants for Cellular-Glass 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
 2. Joint Sealants for Polystyrene Products: Subject to compliance with requirements, provide the following:
 - a. Childers Products, Division of ITW; CP-70.
 - b. Foster Products Corporation, H. B. Fuller Company; 30-45/30-46.
 - c. Marathon Industries, Inc.; 405.
 - d. Mon-Eco Industries, Inc.; 44-05.
 - e. Vimasco Corporation; 750.
 3. Materials must be compatible with insulation materials, jackets, and substrates.
 4. Permanently flexible, elastomeric sealant.
 5. Service Temperature Range: Minus 100 to plus 300 deg F.
 6. Color: White or gray.
 7. 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).
- B. FSK and Metal Jacket Flashing Sealants:
1. Products: Subject to compliance with requirements, provide the following:
 - a. Childers Products, Division of ITW; CP-76-8.
 - b. Foster Products Corporation, H. B. Fuller Company; 95-44.
 - c. Marathon Industries, Inc.; 405.



- d. Mon-Eco Industries, Inc.; 44-05.
 - e. Vimasco Corporation; 750.
 - f. 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: Aluminum.
 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).
- C. ASJ Flashing Sealants, and PVC Jacket Flashing Sealants:
1. Products: Subject to compliance with requirements, provide the following:
 - a. Childers Products, Division of ITW; CP-76.
 - b. Loctite
 - c. Dow Corning
 - 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).

2.6 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. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
 3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.
 4. FSP Jacket: Aluminum-foil, fiberglass-reinforced scrim with polyethylene backing; complying with ASTM C 1136, Type II.
 5. Vinyl Jacket: White vinyl with a permeance of 1.3 perms when tested according to ASTM E 96, Procedure A, and complying with NFPA 90A and NFPA 90B.

2.7 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. P.I.C. Plastics, Inc.; FG Series.
 - d. Or Approved Equal



2.8 FIELD-APPLIED JACKETS

- A. Field-applied jackets must comply with ASTM C 921, Type I, unless otherwise indicated.
- B. FSK Jacket: Aluminum-foil-face, fiberglass-reinforced scrim with kraft-paper backing.
- C. 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.
- D. Aluminum Jacket: Comply with ASTM B 209, Alloy 3003, 3005, 3105 or 5005, Temper H-14.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Childers Products, Division of ITW; Metal Jacketing Systems.
 - b. PABCO Metals Corporation; Surefit.
 - c. RPR Products, Inc.; Insul-Mate.
 - d. Or Approved Equal
 - 2. Sheet and roll stock ready for shop or field sizing or factory cut and rolled to size.
 - 3. Finish and thickness are indicated in field-applied jacket schedules.
 - 4. Moisture Barrier for Indoor Applications: 3-mil- thick, heat-bonded polyethylene and kraft paper or 2.5-mil- thick Polysurlyn.
 - 5. Moisture Barrier for Outdoor Applications: 2.5-mil- thick Polysurlyn.
 - 6. Factory-Fabricated Fitting Covers:
 - a. Same material, finish, and thickness as jacket.
 - b. Preformed 2-piece or gore, 45- and 90-degree, short- and long-radius elbows.
 - c. Tee covers.
 - d. Flange and union covers.
 - e. End caps.
 - f. Beveled collars.
 - g. Valve covers.
 - h. Field fabricate fitting covers only if factory-fabricated fitting covers are not available.
- E. Self-Adhesive Outdoor Jacket: 60-mil- thick, laminated vapor barrier and waterproofing membrane for installation over insulation located aboveground outdoors; consisting of a rubberized bituminous resin on a cross-laminated polyethylene film covered with white aluminum-foil facing.



1. Products: Subject to compliance with requirements, provide the following:
 - a. Polyguard; Alumaguard 60.
 - b. 3M; VentureClad 1579CW
 - c. Thermo Tecno Management; IsolPak ALU
 - d. MFM Building products Corp; FlexCAD 400
 - e. Or Approved Equal

2.9 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.
- B. FSK Tape: Foil-face, 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 0827.
 - b. Compac Corp.; 110 and 111.
 - c. Ideal Tape Co., Inc., an American Biltrite Company; 491 AWF FSK.
 - d. Venture Tape; 1525 CW, 1528 CW, and 1528 CW/SQ.
 - e. Or Approved Equal
 2. Width: 3 inches.
 3. Thickness: 6.5 mils.
 4. Adhesion: 90 ounces force/inch in width.
 5. Elongation: 2 percent.
 6. Tensile Strength: 40 lbf/inch in width.
 7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.
- C. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0800.
 - b. Compac Corp.; 120.
 - c. Ideal Tape Co., Inc., an American Biltrite Company; 488 AWF.
 - d. Venture Tape; 3520 CW.
 - e. Or Approved Equal
 2. Width: 2 inches.
 3. Thickness: 3.7 mils.
 4. Adhesion: 100 ounces force/inch in width.



5. Elongation: 5 percent.
6. Tensile Strength: 34 lbf/inch in width.

2.10 SECUREMENTS

- A. Aluminum Bands: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 1/2 inch 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. 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) RPR Products, Inc.; Bands.
 - 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. Products: Subject to compliance with requirements, provide one of the following:
 - 1) GEMCO.
 - 2) Midwest Fasteners, Inc.
 - 3) RPR Products, Inc.; Bands.
 - 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

2.11 CORNER ANGLES

- A. 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 applies 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, 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. Restore joint separations and cracking due to thermal movement.
- O. 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 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.
 - 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. 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.
 - 1. Comply with requirements in Division 07 Section "Firestops and Smoke seals" fire-stopping and fire-resistive joint sealers.
- F. Insulation Installation at Floor Penetrations:
 - 1. Duct: Install insulation continuously through floor penetrations that are not fire rated. For penetrations through fire-rated assemblies, terminate insulation at fire damper sleeves and externally insulate damper sleeve beyond floor to match adjacent duct insulation. Overlap damper sleeve and duct insulation at least 2 inches.
 - 2. Pipe: Install insulation continuously through floor penetrations.
 - 3. Seal penetrations through fire-rated assemblies. Comply with requirements in Division 07 Section "Firestops and Smoke seals."



3.5 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 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.

3.6 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 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. 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 overcompress 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 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.
 - D. Board 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, space 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 overcompress insulation during installation.
 - e. 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 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. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Groove and score insulation to fit as closely as possible to outside and inside radius of elbows. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
 6. 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.

3.7 FIELD-APPLIED JACKET INSTALLATION

- A. Where FSK jackets are indicated, install as follows:
 1. Draw jacket material smooth and tight.
 2. Install lap or joint strips with same material as jacket.
 3. Secure jacket to insulation with manufacturer's recommended adhesive.
 4. Install jacket with 1-1/2-inch laps at longitudinal seams and 3-inch- wide joint strips at end joints.
 5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.
- B. Where PVC jackets are indicated, install with 1-inch 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.
- C. 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.

3.8 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 Section 09 90 00 Painting and Coating.
 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.

3.9 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 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 two location(s) for each type of equipment. For large equipment, remove only a portion adequate to determine compliance.
 - 3. 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 strainers, three locations of welded strainers, three locations of threaded valves, and three 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.

3.10 DUCT INSULATION SCHEDULE, GENERAL

- A. Plenums and Ducts Requiring Insulation:
 - 1. Indoor, concealed supply and outdoor air.
 - 2. Indoor, concealed return or exposed located in unconditioned space.
 - 3. Indoor, exposed exhaust between isolation damper and penetration of building exterior.
- B. Items Not Insulated:
 - 1. Metal ducts with duct liner of sufficient thickness to comply with energy code and ASHRAE/IESNA 90.1.
 - 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.

3.11 INDOOR DUCT AND PLENUM INSULATION SCHEDULE

- A. Concealed, Supply-Air Duct and Plenum Insulation: Mineral-fiber blanket, 1-1/2 inches thick and 1.50-lb/cu. ft. nominal density.



- B. Concealed, Return-Air Duct and Plenum Insulation: Mineral-fiber blanket, 1-1/2 inches thick and 1.50-lb/cu. ft. nominal density.
- C. Concealed, Outdoor-Air Duct and Plenum Insulation: Mineral-fiber blanket 1-1/2 inches thick and 1.5-lb/cu. ft., nominal density.
- D. Concealed, Exhaust-Air Duct and Plenum Insulation: Mineral-fiber blanket, 1-1/2 inches thick and 1.5-lb/cu. ft. nominal density.

3.12 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.

3.13 INDOOR PIPING INSULATION SCHEDULE

- A. Refrigerant Piping:
 - 1. Flexible Elastomeric: 1 inch thick
- B. AC Condensate:
 - 1. Mineral-Fiber, Preformed Pipe, Type I: 3/4-inches thick.
 - 2. Flexible Elastomeric: 3/4 inch thick

END OF SECTION 23 07 00

SECTION 23 08 00**COMMISSIONING OF 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 commissioning process requirements for HVAC&R systems, assemblies, and equipment.
- B. Related Sections:
 - 1. DDC General Conditions Section 019113 "General Commissioning Requirements for MEP Systems" for general commissioning process requirements.

1.3 DESCRIPTION

- A. Commissioning is a systematic process of confirming that all building systems perform interactively according to the Owner's Project Requirements and the Basis of Design and continuing through construction, acceptance and the warranty period with actual verification of performance.
- B. The Commissioning process does not take away from or reduce the responsibility of the Contractor to provide a finished and fully functioning product.
- C. The CxA directs and coordinates the commissioning activities and reports to the Commissioner. All members in the construction process work together to fulfill their contracted responsibilities and meet the objectives of the Owner's Project Requirement's as detailed in the Contract Documents.

1.4 DEFINITIONS

- A. Refer to the DDC General Conditions for definitions.

1.5 SUBMITTALS

- A. The CxA will review and approve submittals related to the commissioned equipment for conformance to the Contract Documents as it relates to the commissioning process, to the functional performance of the equipment and adequacy for developing test procedures. This review is intended primarily to aid in the development of functional testing procedures and only

secondarily to verify compliance with equipment specifications. The CxA will notify the Contractor, or Commissioner as requested, of items missing or areas that are not in conformance with Contract and which require resubmission.

- B. The CxA will receive a copy of the final approved submittals.
- C. In addition, the Contractor is to provide the following:
 - 1. Certificate of readiness
 - 2. Certificates of completion of installation, prestart, and startup activities.
 - 3. O&M manuals
 - 4. Test reports
- D. Refer to the DDC General Conditions Sections 013300 “Submittal Procedures” and 019113 “General Commissioning Requirements for MEP Systems” for general commissioning submittal requirements.

1.6 QUALITY ASSURANCE

- A. Test Equipment Calibration Requirements: The Contractor will comply with test manufacturer’s calibration procedures and intervals. Recalibrate test instruments immediately after instruments have been repaired resulting from being dropped or damaged. Affix calibration tags to test instruments. Furnish calibration records to CxA upon request.

1.7 COORDINATION

- A. 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.
- B. 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.
- C. 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 shall be provided with the subsequent meeting minutes for review.
- D. Pre-testing Meetings: The Contractor will attend pretest meetings with the Commissioning Team, chaired by the CxA, to review startup reports, pre-test 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.

- E. Testing: The Contractor will coordinate with testing personnel and agencies for timing and access for CxA to witness test.
- F. Manufacturers' Inspection and Startup Services: The Contractor will coordinate services of manufacturers' inspection and startup services.
- G. Testing, Adjusting and Balancing: The Contractor will coordinate with plan and schedule for testing, adjusting and balancing for timing and access for CxA to witness process.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

- A. All standard testing equipment required to perform startup, initial checkout and functional performance testing shall be provided by the Contractor for the equipment being tested. For example, the Contractor shall ultimately be responsible for all standard testing equipment for the HVAC&R system and controls system in Division 23. A sufficient quantity of two-way radios shall be provided by the Contractor.
- B. Proprietary test equipment and software required by any equipment manufacturer for programming and/or start-up, whether specified or not, shall be provided by the manufacturer of the equipment. Manufacturer shall provide the test equipment, demonstrate its use, and assist in the commissioning process as needed. Proprietary test equipment (and software) shall become the property of the City of New York's personnel upon completion of the commissioning process.
- C. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the Specifications. If not otherwise noted, the following minimum requirements apply: Temperature sensors and digital thermometers shall have a certified calibration within the past year to accuracy of 0.5°F and a resolution of + or - 0.1°F. Pressure sensors shall have an accuracy of + or - 2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year.

PART 3 - EXECUTION

3.1 GENERAL DOCUMENTATION REQUIREMENTS

- A. With assistance from the Contractor, the CxA will prepare Pre-Functional Checklists for all commissioned components, equipment, and systems. These checklists shall be provided to the Contractor for completion. The CxA shall gather and review the completeness and accuracy of these checklists via site visits.
- B. Red-lined Drawings (As-Built): Contractor will verify all equipment, systems, instrumentation, wiring and components are shown correctly on red-lined drawings. Preliminary red-lined drawings must be made available to the Commissioning Team for use prior to the start of Functional Performance Testing. Changes, as a result of Functional Testing, must be incorporated into the final as-built drawings, which will be created from the red-lined drawings. The Contractor will create the as-built drawings.

- C. Operation and Maintenance Data: Contractor will provide a copy of O&M literature within 45 days of each submittal acceptance for use during the commissioning process for all commissioned equipment and systems. The CxA will review the O&M literature once for conformance to project requirements. The CxA will receive a copy of the final approved O&M literature once corrections have been made by the Contractor.
- D. Demonstration and Orientation: Contractor will provide demonstration and orientation as required by the specifications. A complete orientation plan and schedule must be submitted by the Contractor to the CxA four weeks (4) prior to any orientation. An orientation agenda for each orientation session must be submitted to the CxA one (1) week prior the orientation session.

3.2 CONTRACTOR'S RESPONSIBILITIES

- A. Refer to the DDC General Conditions Section 019113 "General Commissioning Requirements for MEP systems" for Contractor's responsibilities.
- B. The Contractor will attend construction phase controls coordination meetings and ensure that the HVAC and controls subcontractors attend.
- C. The Contractor will attend testing, adjusting, and balancing review and coordination meetings and ensure that the HVAC and balancing subcontractors attend.
- D. Provide information requested by the CxA for final commissioning documentation.
- E. Prepare preliminary schedule for mechanical system orientations and inspections, operation and maintenance manual submissions, orientation sessions, pipe and duct system testing, flushing and cleaning, equipment start-up, testing and balancing and task completion for the City of New York. Distribute preliminary schedule to commissioning team members at the beginning of the construction phase.
- F. 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.
- G. Provide detailed startup procedures.
- H. 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.
- I. Provide a written schedule frequency to review the various set-points and reset schedules to ensure they are current relevant and efficient values.
- J. Respond to provided new deficiencies and/or responses within five (5) business days.
- K. 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.
- L. Coordinate with the CxA to provide 48-hour advance notice so that the witnessing of equipment and system start-up and testing can begin.
- M. 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.



- N. 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.
 - 1. HVAC&R equipment including all fans, air handling units, ductwork, dampers, terminals, and all other equipment furnished under this Division
- O. The equipment suppliers shall document the performance of their equipment.
- P. Provide a complete set of red-lined drawings to the CxA prior to the start of Functional Performance Testing.
- Q. Test, Adjust and Balance subcontractor, under the direction of the Contractor:
 - 1. Attend initial commissioning coordination meeting scheduled by the CxA.
 - 2. Submit the site-specific testing and balancing plan to the CxA and Commissioner for review and acceptance.
 - 3. Attend the testing and balancing review meeting scheduled by the CxA. Be prepared to discuss the procedures that shall be followed in testing, adjusting, and balancing the HVAC&R system.
 - 4. At the completion of the testing and balancing work, and the submittal of the final testing and balancing report, notify the HVAC&R subcontractor and the Contractor.
 - 5. Participate in verification of the testing and balancing report, which will consist of repeating measurements contained in the testing and balancing reports. Assist in diagnostic purposes when directed.
 - 6. Provided recommended setpoints as determined by testing, adjusting, and balancing, such as static pressure and differential pressure setpoints.
- R. Contractor responsibilities to be completed by Equipment Suppliers:
 - 1. 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.
 - 2. Assist in equipment testing.
 - 3. Provide information requested by CxA regarding equipment sequence of operation and testing procedures.

3.3 CxA'S RESPONSIBILITIES

A. Roles and Responsibilities

- 1. Refer to the DDC General Conditions section 019113 "General Commissioning Requirements for MEP Systems" for CxA responsibilities.

3.4 TESTING PREPARATION

- A. Certify in writing to the CxA that HVAC&R systems, subsystems, and equipment have been installed, calibrated, and started and are operating according to the Contract Documents.
- B. Certify in writing to the CxA that HVAC&R instrumentation and control systems have been completed and calibrated, that they are operating according to the Contract Documents, and that pretest set points have been recorded.

- C. Certify in writing that testing, adjusting, and balancing procedures have been completed and that testing, adjusting, and balancing reports have been submitted, discrepancies corrected, and corrective work approved.
- D. Place systems, subsystems, and equipment into operating mode to be tested (e.g., normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).
- E. Inspect and verify the position of each device and interlock identified on checklists.
- F. Check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.
- G. Testing Instrumentation: Install measuring instruments and logging devices to record test data as directed by the CxA.

3.5 TESTING, ADJUSTING AND BALANCING VERIFICATION

- A. Prior to performance of Testing, Adjusting, and Balancing work, provide copies of reports, sample forms, checklists, and certificates to the CxA.
- B. Notify the CxA at least ten (10) days in advance of testing and balancing Work and provide access for the CxA to witness testing and balancing Work.
- C. Provide technicians, instrumentation, and tools to verify testing and balancing of HVAC&R systems at the direction of the CxA.
 - 1. The CxA will notify the Contractor ten (10) days in advance of the date of field verification. Notice will not include data points to be verified.
 - 2. The Contractor will ensure that the testing and balancing subcontractor shall use the same instruments (by model and serial number) that were used when original data were collected.
 - 3. Failure of an item includes, other than sound, a deviation of more than 10 percent. Failure of more than 10 percent of selected items shall result in rejection of final testing, adjusting, and balancing report. For sound pressure readings, a deviation of 3 dB shall result in rejection of final testing. Variations in background noise must be considered.
 - 4. Remedy the deficiency and notify the CxA so verification of failed portions can be performed.

3.6 GENERAL TESTING REQUIREMENTS

- A. Provide technicians, instrumentation, and tools to perform commissioning test at the direction of the CxA.
- B. Scope of HVAC&R testing shall include entire HVAC&R installation, from central equipment for heat generation and refrigeration through distribution systems to each conditioned space. Testing shall include measuring capacities and effectiveness of operational and control functions.
- C. Test all operating modes, interlocks, control responses, and responses to abnormal or emergency conditions, and verify proper response of building automation system controllers and sensors.

- D. The CxA along with the Contractor, who will ensure that the HVAC&R subcontractor, testing and balancing subcontractor, and HVAC&R Instrumentation and Control subcontractor participate, shall prepare detailed testing plans, procedures, and checklists for HVAC&R systems, subsystems, and equipment.
- E. Tests will be performed using design conditions whenever possible.
- F. 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.
- G. The CxA may direct that set points be altered when simulating conditions is not practical.
- H. 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.
- I. If tests cannot be completed because of a deficiency outside the scope of the HVAC&R system, document the deficiency and report it to the Commissioner. After deficiencies are resolved, reschedule tests.
- J. If the testing plan indicates specific seasonal testing, complete appropriate initial performance tests and documentation and schedule seasonal tests.

3.7 HVAC&R SYSTEMS, SUBSYSTEMS, AND EQUIPMENT TESTING PROCEDURES

- A. Equipment Testing and Acceptance Procedures: Testing requirements are specified in individual Division 23 sections. Provide submittals, test data, inspector record, and certifications to the CxA.
- B. HVAC&R Instrumentation and Control System Testing: Field testing plans and testing requirements are specified in Division 23 Section 230900 "Instrumentation and Control for HVAC". Assist the CxA with preparation of testing plans.
- C. Pipe system cleaning, flushing, hydrostatic tests, and chemical treatment: Test requirements are specified in Division 23 piping Sections. HVAC&R subcontractor shall prepare a pipe system cleaning, flushing, and hydrostatic testing plan. Provide cleaning, flushing, testing, and treating plan and final reports to the CxA. Plan shall include the following:
 - 1. Sequence of testing and testing procedures for each section of pipe to be tested, identified by pipe zone or sector identification marker. Markers shall be keyed to Drawings for each pipe sector, showing the physical location of each designated pipe test section. Drawings keyed to pipe zones or sectors shall be formatted to allow each section of piping to be physically located and identified when referred to in pipe system cleaning, flushing, hydrostatic testing, and chemical treatment plan.
 - 2. Description of equipment for flushing operations.
 - 3. Minimum flushing water velocity.
 - 4. Tracking checklist for managing and ensuring that all pipe sections have been cleaned, flushed, hydrostatically tested, and chemically treated.

- D. Refrigeration System Testing: Provide technicians, instrumentation, tools, and equipment to test performance of variable refrigerant flow systems. The CxA shall determine the sequence of testing and testing procedures for each equipment item and pipe section to be tested.
- E. HVAC&R Distribution System Testing: Provide technicians, instrumentation, tools, and equipment to test performance of VRF split system, Exhaust system and Energy Recovery Ventilators.
- F. Vibration and Sound Tests: Provide technicians, instrumentation, tools, and equipment to test performance of vibration isolation and seismic controls.
- G. The work included in the commissioning process involves a complete and thorough evaluation of the operation and performance of all components, systems and sub-systems. Commissioning shall be performed on equipment and systems including but not limited to the following:
 - 1. VRF Split System
 - 2. Heat Recovery Branch Selector Boxes
 - 3. Electric Heaters
 - 4. Energy Recovery Ventilators
 - 5. Exhaust Fan

3.8 DEFICIENCIES/NON-CONFORMANCE, FAILURE DUE TO MANUFACTURER DEFECT

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 shall be noted and reported to the Commissioner and the Contractor on a standardized form.
- 2. The Contractor shall respond to new deficiencies within five (5) business days. The response shall 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 request 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 will 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, shall be completed by the affected Contractor and photo evidence of the deficiency resolution shall be sent to both the Commissioner and the CxA.

B. Failure due to Manufacturer Defect

1. If 10% or three, whichever is greater, of identical pieces (size alone does not constitute a difference) of equipment fail to perform to the Contract (mechanically or substantively) due to manufacturing defect, not allowing it to meet its submitted performance spec, all identical units may be considered unacceptable by the CxA and the Commissioner. In such case, the Contractor shall provide the Commissioner with the following:
 - a. Within one week of notification from the Contractor the manufacturer's representative shall examine all other identical units making a record of the findings. The findings shall be provided to the Commissioner within two weeks of the original notice.
 - b. Within two weeks of the original notification, the Contractor or manufacturer shall 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 shall 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 shall replace or repair all identical items, at their expense and extend the warranty accordingly, if the original equipment warranty had begun. The replacement/repair work shall proceed with reasonable speed beginning within one week from when parts can be obtained.

3.9 APPROVAL

- A. The CxA notes each satisfactorily demonstrated function on the test form. Formal approval of the functional test is made later after review by the CxA. The CxA recommends acceptance of each test to the Commissioner using a standard form.

3.10 SEASONAL TESTING

- A. Seasonal Testing – During the warranty period, seasonal testing (tests delayed until weather conditions are closer to the system's design) shall be completed as part of this contract. The CxA shall coordinate this activity. Tests will be executed, documented and deficiencies corrected by the Contractor, with facilities staff and the CxA witnessing. Any final adjustments to the O&M manuals and record documents due to seasonal testing will be made by the Contractor.

3.11 OPERATION AND MAINTENANCE MANUALS

- A. The Operation and Maintenance Manuals shall conform to Contract requirements as stated in the DDC General Conditions Sections 017839 "Contract Record Documents" and 019113 "General Commissioning Requirements for MEP Systems."

- B. The specific content and format requirements for the standard O&M manuals are detailed in the DDC General Conditions 017839 “Contract Record Documents” and 019113 “General Commissioning Requirements for MEP Systems.” Special requirements for the controls Contractor and TAB Contractor are found in Division 23.
- C. CxA Review and Approval – Prior to substantial completion, the CxA shall review the O&M manuals, documentation and record documents for systems that were commissioned to verify compliance with the Specifications. 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 O&M manuals to the Commissioner. The CxA also reviews each equipment warranty and verifies that all requirements to keep the warranty valid are clearly stated.

3.12 INSTRUCTION OF CITY OF NEW YORK PERSONNEL

- A. The Contractor shall be responsible for instruction coordination, scheduling, and ultimately for ensuring that instruction is completed.
- B. The CxA shall oversee the instruction of the City of New York’s personnel for commissioned equipment and systems.
 - 1. The CxA shall 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 shall decide how rigorous the instruction should be for each piece of commissioned equipment. The CxA shall 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 shall 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. For the primary HVAC equipment, the Contractor shall ensure that the controls subcontractor provide a discussion of the control of the equipment during the mechanical or electrical instruction conducted by each subcontractor or vendor.
6. Instruction documentation shall include the following items:
 - a. Copy of the instruction plan, including schedule, syllabus, and agenda.
 - b. Copy of the Owner's Project Requirements.
 - c. Copy of the Basis of Design.
 - d. Compiled operations manuals.
 - e. Compiled maintenance manuals.
 - f. Completed manufacturer instruction manuals.
 - g. Red-lined drawings.
7. 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.
8. At one of the instruction sessions, the CxA presents a presentation discussing the use of the blank functional test forms for re-commissioning equipment.
9. Video recording of the instruction sessions will be verified by the CxA in electrical format, at the discretion of the Commissioner.

END OF SECTION 230800



THIS PAGE INTENTIONALLY LEFT BLANK



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. Description of Work: 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 Contractor that is regularly engaged in the installation and maintenance of ATC systems. The Contractor must provide all necessary information and required field supervision for a complete and operable automatic temperature control system.
- C. The Contractor must be responsible for a complete system of electronic automatic temperature controls. The Contractor 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. Furnish all line voltage and low voltage wiring, conduit, panels, and accessories for a complete operational control system. The Contractor 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. Furnish all wells for water monitoring devices, flow switches, and alarms.

1.3 SUBMITTALS 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.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. 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.
- C. 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, for a period of not less than three years.

1.6 USER'S MANUALS

- A. Submit two (2) draft copies of User's manual for review. After review by authorized representative, the contractor must incorporate review comments and must submit four (4) interim final copies. Upon completion of project, acceptance of project by the Commissioner, submit in digital format "as built" manual. 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.

1.7 WORK PERFORMANCE SCHEDULE

- A. 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.

1.8 GUARANTEE

- A. The Contractor must guarantee the ATC system to be free from defects in workmanship and material for a period of one (1) year from the date of substantial completion. During the guarantee period, the Contractor must furnish all labor to repair or replace all items or components that fail due to defects in workmanship or material.

1.9 INSTRUCTION



- A. The Contractor must provide competent instructors to give full instruction to designated personnel 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 4 hours of instruction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. Sole Source Product: The automatic temperature control system and all components must be Honeywell, BACnet MSTP/IP network communication utilizing Tridium Jace 8000 controller powered by Niagara 4 framework.
- B. No substitutions permitted.

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 control under this contract is to be fully modulating type, except where noted otherwise. The system must be complete in all respects including sensors, valves, 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, properly trained by the manufacturer.

2.3 OPERATOR / NETWORK INTERFACE

- A. Tridium Jace 8000 controller powered by Niagara 4 framework is the basis of design as a controller/sever front end powered by Niagara 4 framework. This controller will 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 must not be 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), must not be 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. Graphics runtime functions –Each graphic application must be capable of the following functions, All graphics must be fully scalable, The graphics must support a maintained aspect ratio, Multiple fonts must be supported and Unique background must be assignable on a per graphic basis. It must be possible to change values (setpoints) and



states in systems controlled equipment within the Web browser interface. 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 using the Niagara Framework software. Controller must be Tridium JACE 800. No substitutions.
- 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 \pm 10% @ 75 mA maximum
5. Environmental:
 - a. Temperature: Minimum -40° F (-40° C); Maximum 150° F (65.5° C)
 - b. Relative Humidity: 5% to 95% non-condensing
6. Operating Range
 - a. 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
 - b. 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)
 - c. Accuracy: \pm 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 (30 pF per foot). Distributed capacitance between conductors and shield must be less than 200 pF per meter (60 pF per foot). Foil or braided shields are acceptable. The Honeywell tested and recommended MS/TP cable is Honeywell Cable 3322 (18 AWG, 1-Pair, Shielded, Low Cap, Plenum cable), alternatively Honeywell Cable 3251 (22 AWG, 1-Pair, Shielded, Plenum cable) is available and meets the BACnet Standard requirements.
- B. Building Controllers: The BACnet MS/TP network is polarity sensitive. The maximum BACnet MS/TP network Bus segment length is 4,000 ft. (1,219 m) using recommended wire. Repeaters must be used when making runs longer than 4,000 ft. (1,219 m). A maximum of three repeaters can be used between any two devices.

2.6 FIELD DEVICES

- A. General



1. All devices and equipment must be approved for installation.

B. Temperature Sensors

1. All temperature sensors must use RTD with sensor accuracy of +/- .5 deg F. Provide Minco, Vaisala, Mamac or equal.
2. Single Point Duct Temperature Sensor
 - a. These must consist of a sensing element, junction box for wiring connections, and a gasket to prevent air leakage or vibration noise. The temperature range as required for resolution is indicated above. The sensor probe must be stainless steel.
 - b. Sensing element - RTD or thermistor +/- 0.5 deg F accuracy at calibration point.
3. Averaging Duct Temperature Sensor
 - a. These must consist of an averaging element, junction box for wiring connections and gasket to prevent air leakage. Provide sensor lengths and quantities to result in one foot of sensing element for each, two square feet of coil/duct face area. Temperature range must be as required for resolution as indicated above.
 - b. Sensing element - RTD or thermistor +/- 0.5 deg F accuracy at calibration point.
4. OA Sensors
 - a. These must consist of a sensor, sun shield, utility box, and watertight gasket to prevent water seepage. The temperature range must be as required for the resolution indicated above;
 - b. Sensing element - RTD, thermistor, or integrated circuit, +/- 0.4 deg F accuracy at calibration point;
 - c. On major/critical systems, one must be provided for each;
 - d. Sensors must be located on a north wall of the building and installed with stand-offs. On 100% OA systems and lab buildings, locate sensor in outside air plenum.
 - e. Provide one sensor per mechanical room or building-level controller.

C. Pressure Sensors

1. Air Differential Pressure Transmitters:
 - a. Applications: Duct static pressure, air flow VP, filter DP, Fan DP, etc.;
 - b. Provide the smallest range feasible for the application. Provide zero and span adjustments;



- c. Accuracy: Plus or minus 1% of full scale for static and 0.25% for air velocity.
- d. Acceptable Manufacturers (Airflow): Air Monitor, Paragon, Greenheck, approved equal.
- e. Acceptable Manufacturers (Filter DP): Dwyer, Sensacon, Differential Pressure Plus , approved equal.
- f. Acceptable Manufacturers (General and Static Pressure): Mamac, Setra. Omron or approved equal.

D. Air Flow Station w/Low Leakage Damper

1. System Description

- a. Air monitoring station incorporates a low leakage control damper with air monitoring blades and air straightener section in one assembly.
- b. Control damper is designed for modulating operation and utilizes standard blade and jamb seals for low leakage.
- c. Strategically placed airflow sensing blades measure airstream velocity.
- d. Air tubing and piping connections connect sensing blades to controller.
- e. Using velocity information provided from sensing blades, controller will calculate a cfm value. This value will then be compared to design cfm setpoint as determined by particular mode of operation of HVAC system. In normal operation, this setpoint will correspond to minimum outside air ventilation required by system design to meet ASHRAE 62.
- f. Based on difference between actual cfm reading and desired setpoint, controller will interact with control damper actuator to position damper blades as necessary to ensure that actual outside air flow meets desired level.

2. Product

- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following
 - 1) Ruskin,
 - 2) Greenheck,
 - 3) Nailor Hart,
 - 4) Approved equal
- b. Frame: Nominal 4 inches x 1 inch x minimum 0.081 inch (102 x 25 x minimum 2 mm) 6063-T5 extruded aluminum channel control damper frame. Mounting flanges on both sides of frame.
- c. Blades:
 - 1) Control Damper: Airfoil-shaped, heavy gage, 6063-T5 extruded aluminum.
 - 2) Airflow Monitoring: Airfoil-shaped, heavy gage, anodized 6063-T5 extruded aluminum. Fixed in 10 inches x minimum 16 gage galvanized steel frame.
- d. Seals



- 1) Jamb: Flexible metal compression type along control damper sides.
 - 2) Blade: Ruskiprene seal along control damper blade edges.
 - e. Bearings: Molded synthetic
 - f. Linkage: Galvanized steel, concealed in frame
 - g. Axles: Minimum 1/2 inch (13 mm) diameter plated steel, hex-shaped, mechanically attached to blade.
 - h. Operating Temperature: -22 to 140 degrees F
 - i. Air Straightener Section: 3000 series aluminum alloy honeycomb. Contained in 5 inches long, 16 gage galvanized steel sleeve attached to monitoring blade frame. Flanged as required.
 - j. Mounting style: Flanged
 - k. Finish: Galvanized
 - l. Assembly: Factory assemble air monitoring station, actuator, options, and accessories.
 3. Performance Data: 300 to 5,000 feet per minute face velocity
 4. Accuracy: 3% deviation average across measurement range.
 5. Transducer:
 - a. Glass-on-silicone GL-Si capacitance sensor pressure transducer capable of measuring up to six field selectable pressure ranges up to 1" water column (249 Pa). The transducer must be accurate to $\pm 1\%$ of full scale and be contained in a NEMA 4 (IP-65) painted steel enclosure.
 - b. Transducer must be factory mounted and piped to high and low brass pressure fittings from the sensor averaging ports. All sensor tubing must terminate in solid brass barbed fittings. Tubing and associated fittings to be contained in a formed steel protective tubing shield to protect pressure station during transit
 6. Options to include:
 - a. Electric actuator
 - b. Controller: Factory calibrated
- E. Current Switches (CS)
1. For Constant Speed Motors:
 - a. CS must be provided for status indication of constant speed motors;
 - b. Switch must indicate loss of status when current falls below an adjustable trip point;
 - c. CS must include LED indication of status;
 - d. Manufacturer: Veris Industries (H708/ H908 series), Kele, Eaton, approved equal..
 2. For Variable Speed Motors/ VFD:



- a. Typically, status indication that indicates VSD or bypass operation must be derived from contacts on the VSD. The VSD must be specified to include this option;
 - b. Otherwise, a current switch must be provided for status indication. The switch must be microprocessor based and suitable for use on a VSD;
 - c. Self-adjusting trip setpoint;
 - d. Factory programmed to detect belt loss undercurrent conditions;
 - e. CS must include LED indication of status;
 - f. Manufacturer: Hawkeye, Veris, Eaton, approved equal.
3. Static pressure transmitter must be Setra C-C-264, Omega, Sensacon , approved equal.

F. Binary Sensors

1. Water differential pressure switches must Merciod, Omega, Sensacon, approved equal.
2. Air differential pressure switches must be diaphragm type, die-cast aluminum housing, adjustable setpoint, with a SPDT switch. Rating must be a minimum of 5 amps at 120 VAC. Switch pressure range must be suited for the application.
3. Low temperature detector (Ltd) must be automatic reset, DPDT type. Ltd must be installed in a serpentine fashion across the coil in the air stream in accordance with the manufacturer's recommendations. Element must be arranged to lock out the associated fan should the temperature at any point along the sensing element fall below 35 °f for an adjustable time period.
4. Current sensing relays must be split core, two wire, loop powered and sized for expected amperage. Unit must be UL listed. Provide status LED's for current sensed below setpoint, current sensed above setpoint and loop power failure. The unit must automatically range itself and have solid state outputs.

G. Single Point Leak Detector

1. Provide Liebert LT-410, BAPI, Kele or approved equal. The 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.

H. Control Dampers

1. Dampers must be applicable for the rated pressure and velocity service. Damper structural rating must exceed extreme anticipated conditions like fan deadhead.
2. Modulating dampers must be carefully selected to control in a smooth and stable fashion across the range of anticipated conditions. Except where size dictates a single blade, dampers must always be opposed blade. When a large section of



damper is to be connected to a single jackshaft, size limitations must be followed. This will prevent excessive damper area or, more importantly, length from being connected to a single jackshaft. Typically, the manufacturer's recommendation must be sufficient for specifying a limit to the size of a damper bank that may have field fabricated jackshaft connections.

3. Whenever possible, dampers must have external crankshafts to allow the connection of the damper actuator outside of the air stream. This will allow for easier access to the actuators for maintenance.
4. OA control dampers must be low leakage dampers with damper seals.
5. Output to modulating control dampers must be analog.
6. Manufacturers: Ruskin, Nailor, Greenheck, approved equal.

I. Damper Actuators

1. General: Size actuators and linkages to operate their appropriate dampers or valves with sufficient reserve torque or force to provide smooth modulating action or two-position action and adequate close off rating as required.
2. Damper actuators must be electronic type, 24 VAC with spring return. Size actuator for torque requirements of damper. Provide limit switches to protect motor against burnout. Damper motor must be Belimo, Johnson Controls, Honeywell or approved equal.
3. For duct mounted dampers:
 - a. All Actuators must be electronic.
 - b. Electronic Actuators: Must be designed for a minimum of 60,000 full cycles at full torque and be UL 873 listed. Provide stroke indicator. Actuators must have a positive positioning circuit and selectable inputs. Full stroke must be within 90 seconds. Where fail positions are required, provide spring return on the actuator with adequate close off force.
 - c. Manufacturers: Belimo, Honeywell, Johnson Controls, approved equal.
4. For terminal unit dampers:
 - a. Electronic Actuators: Must be designed for a minimum of 60,000 full cycles at full torque. Provide stroke indicator. Output to modulating damper actuators may be analog or floating.
5. End switches: provide end switches for all control dampers

J. Electric Thermostat

1. Furnish and install 24 volts thermostats for unit heaters. Thermostat contacts must be rated for maximum heater amperage and must be snap acting, SPDT.
2. Thermostat must have a concealed setpoint adjustment.
3. Thermostat must have concealed thermometer temperature indication.



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. Install control valves horizontally with the power unit up. Installation of control valves will be by the Contractor.
8. 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.
9. 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 HVAC equipment based on occupancy schedules. 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.

3.3 ELECTRICAL INSTALLATION WIRING AND MATERIALS



- A. The Contractor must be 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 all NYC Electrical Code, NEC and NFPA.
 2. Install all line voltage wiring, concealed or exposed, in conduit in accordance with the Division 26 specifications, NEC and local building code. Utilize #14 A.W.G. THWN conductors 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 contract documents.
 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).
 - b. Binary In (BI) - Defined as any two-state input (alarm, status).
 - c. Analog In (AI) - Defined as any variable input (temperature) (position).
 - 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 VRV HEAT RECOVERY SYSTEM (ACC-1A,1B, ACC-2)

- A. Refer to Section 23 62 46 Packaged Variable Refrigerant Flow Air Conditioning” for the factory furnished control and associated sequences. The ATC Contractor must provide all required field wiring of controls that cannot be factory installed for proper AC unit operation. The ATC Contractor must connect the direct digital controller to the NAC network for point monitoring and control from the central BMS system.

- B. The unit must run according to a user definable schedule.

1. The indoor unit must be programmed in auto mode
2. Program user defined set-point for occupied mode
3. Program user defined set-back setpoint for unoccupied mode
4. 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. Air-Conditioning Mode
5. Room Temperature Setpoint
6. Room Temperature



7. Indoor Fan Status
8. Airflow Rate Setting
9. Room - High Temperature Alarm
10. Room - High Temperature Alarm
11. Malfunction Code
12. Filter Status

4.3 ENERGY RECOVERY VENTILATOR – ON/OFF (ERV-1,2)

- A. The ERV must interlocked to run with VRV system via VRV system central controller.
- B. ERV must be enabled whenever VRV system units are run in occupied mode.
- C. The fire smoke damper at air intake and 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 via end switches.
- D. The ERV unit once enabled will operate under manufacture provide controls to include but not limited to:
 1. Unit safeties
 2. Optimize energy recovery
 3. Frost control.
- E. Direct Digital Control Points:
 1. ERV Start/Stop
 2. ERV Fan Failure
 3. Damper Status
 4. Damper Failure
 5. Filter Status
 6. Alarm

4.4 FAN FORCED HEATERS (EH-1)

- A. Fan forced heater must be under control of manufacture furnished inbuilt thermostat.
- B. Heater must be cycled to run to maintain setpoint of 65 deg F (adj).

4.5 FAN FORCED HEATER (EH-2)

- A. Ceiling mount fan forced heater in the vestibule must be under control of manufacture furnished inbuilt thermostat.
- B. Heater must be cycled to run to maintain setpoint of 65 deg F (adj).

4.6 PERIMETER BASEBOARD (EH-3 Group, EH-4 Group)



- A. The perimeter baseboard must energize the heater group via the BMS system when the outdoor air temperature drops below 30 deg F (adj).
- B. The heater must remain on for outdoor temperatures below 30 deg F and go off when temperature rises above 32 deg F.
- C. Provide relay to energize heater(s).
- D. Direct Digital Control Points:
 - 1. Heater status
 - 2. Setpoint

4.7 PERIMETER BASEBOARD (EH-4 Group)

- A. The perimeter baseboard must energize the heater group via the BMS system when the outdoor air temperature drops below 30 deg F (adj).
- B. The heater must remain on for outdoor temperatures below 30 deg F and go off when temperature rises above 32 deg F.
- C. 2-10V from BMS must energize heater and modulate capacity with maximum output at 10 deg F outdoors.
- D. Direct Digital Control Points:
 - 1. Heater status
 - 2. Setpoint

4.8 WALL MOUNT HEATER (EH-5)

- A. Wall mount fan forced heater in the vestibule must be under control of manufacture furnished inbuilt thermostat.
- B. Heater must be cycled to run to maintain setpoint of 65 deg F (adj).

4.9 RADIANT PANEL HEATER (EH-6)

- A. Radiant panel heaters at Circulation Desk must be under control of wall mount programmable thermostat
- B. Heater must be cycled to run to maintain setpoint of 75 deg F (adj).
- C. Heater must be energized via electronic countdown timer set to maximum cycle run time of 2 hrs (adjustable) once energized. Electronic countdown timer must be Intermatic Model 4XGV7, Leviton, Eaton, approved equal.
- D. Field coordinate countdown timer and thermostat location with Commissioner.

4.10 EXHUAUST FAN – ON/OFF (EF-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 fan runs and must close anytime the fan stops. The fan must be enabled after the damper status has proven via end switch.
- 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

4.11 IT CLOSET (AC-2F)

- A. Refer to 23 62 46 “Packaged Variable Refrigerant Flow Air Conditioning” for the factory furnished control and associated sequences. The ATC Contractor must provide all required field wiring of controls that cannot be factory installed for proper AC unit operation. The ATC Contractor must connect the direct digital controller to the NAC network for point monitoring and control from the central BMS system.
- B. Direct Digital Control Points:
 - 1. Room high temperature alarm

4.12 MISCELLANEOUS

- A. Provide high temperature alarm and pan leak detectors to include the following:
 - 1. Mechanical Room 116 - High temperature sensor with alarm at BMS
 - 2. IT/Sec Room 110 - High temperature sensor with alarm at BMS
 - 3. Pan Leak Detector Alarm for
 - a. VRV Indoor Units (Qty 9) wired to shutdown unit and annunciate alarm at BMS in event of leak
 - b. Domestic hot water heaters WH-1,2 (Qty 2) to annunciate alarm at BMS in event of leak

END OF SECTION 23 0900



THIS PAGE INTENTIONALLY LEFT BLANK

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 removal of existing refrigerant containing equipment, refrigerant recovery and refrigerant piping used for air-conditioning applications.

1.3 SUBMITTALS PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Product Data: For each type of valve and refrigerant piping specialty indicated. Include pressure drop based on manufacturer's test data.
- C. 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.
- D. 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.
- E. Equipment Certification: Submit certification for refrigerant recovery equipment in accordance with requirements of Title 40 CFR. Part 82, Subpart F, Article 82.162.
- F. Field quality-control test reports.
- G. Operation and maintenance data.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Comply with ASHRAE 15, "Safety Code for Refrigeration Systems."
- C. Comply with ASME B31.5, "Refrigeration Piping and Heat Transfer Components."



1.6 PERFORMANCE REQUIREMENTS

- A. Line Test Pressure for Refrigerant R-410 A:
 - 1. Suction Lines for Heat-Pump Applications: 325 psig
 - 2. Hot-Gas and Liquid Lines: 325 psig
- B. 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 2014 New York City Fire Code and all other applicable NY state and Federal regulation.

1.7 BEST MANAGEMENT PRACTICES

- A. The following BMPs are recommended for management and recycle of refrigerant/CFCs:
 - 1. Use only EPA approved refrigerant handling machines when recharging or removing refrigerants.
 - 2. Sell refrigerant to certified technicians or to certified reclamation facilities that will reclaim the refrigerant to its original purity specifications.
 - 3. Dispose of filters from CFC recapture as hazardous waste.
 - 4. Keep accurate records for at least 3 years.
- B. Materials must conform to the latest edition of reference specifications and industry standards specified herein and applicable, and to pertinent codes and requirements NYC Dept. of Buildings.
 - 1. 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.

1.8 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.

1.9 WARRANTY

- A. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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 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. Refrigerant: R-410 A
- B. Manufacturers:
 - 1. Daikin
 - 2. Honeywell
 - 3. Dupont
 - 4. Or Approved Equal

2.3 INSULATION

- A. Manufacturer:
 - 1. Armacell
 - 2. AeroFlex USA Inc
 - 3. AeroFoam USA inc.
 - 4. Or Approved Equal
- B. Insulation must be a flexible, closed-cell elastomeric pipe insulation. Adhesive and UV protective coating must be supplied from same as insulation manufacturer. 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 of 1-1/2" wall thickness minimum in compliance with NYCECC 2016.

2.4 LINE SET COVERS

- A. Provide line set covers complete with fittings and fasteners.
- B. Line set covers must be constructed for superior corrosion & scratch resistance. The duct and fittings must be triple hot dip protected with layers of zinc, aluminum and magnesium for much greater protection than ordinary galvanized steel.
- C. All fasteners must be stainless steel
- D. Basis of Design Product: Subject to compliance with requirements, provide products by Inaba Denko America, RD Series or comparable product by one of the following:
 - 1. Rectorseal
 - 2. Diversitech
 - 3. Approved Equal.

2.5 PROTECTIVE COATINGS

- A. Provide water based latex pliant enamel coating for all outdoor exposed refrigerant insulation for durable weather resistance to ultraviolet and ozone deterioration.
- B. Coating must be heavy bodied, easy brush application suitable for application above 50 deg F , non-flammable with VOC content less than 10 grams/liter
- C. Protective coating must be from same manufacturer as insulation.

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.

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 and system components according to latest edition of ASHRAE 15 and Chapter 11 of 2014 NYC Mechanical code including but not limited to the following requirements:



1. All piping that crosses open space that affords passageways must be installed minimum 7 feet 3 inches above finished floor or tight ceiling slab of open passageways.
 2. All piping installed below 7 feet 3 inches must be protected from mechanical damage.
 3. Refrigerant piping in public corridor must be brazed joints of manufacturer provided pre-charged tubing systems with no joints.
 4. Refrigerant piping and fittings must be concealed or otherwise protected from mechanical damage.
 5. Refrigerant piping must not be installed in enclosed public stairway, stair landing or exit.
 6. All refrigerant piping must be insulated to avoid condensation and meet requirements of thermal insulation for compliance with energy code.
- 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 Division 08 Section "Access Doors and Frames" if valves or equipment requiring maintenance is concealed behind finished surfaces.
- L. Install refrigerant piping in protective conduit where installed belowground.
- M. Install refrigerant piping in rigid or flexible conduit in locations where exposed to mechanical injury.
- N. Slope refrigerant piping as follows:
1. Install horizontal hot-gas discharge piping with a uniform slope downward away from compressor.
 2. Install horizontal suction lines with a uniform slope downward to compressor.
 3. Install traps and double risers to entrain oil in vertical runs.
 4. Liquid lines may be installed level.
- O. 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.



- P. Install pipe sleeves at penetrations in exterior walls and floor assemblies.
- Q. Seal penetrations through fire and smoke barriers according to Division 07 Section "Penetration Firestopping."
- R. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.
- S. Install sleeves through floors, walls, or ceilings, sized to permit installation of full-thickness insulation.
- T. Seal pipe penetrations through exterior walls according to Division 07 Section "Joint Sealants" 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 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 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 contact adhesive.
 - 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 UV protective coating.

3.6 HANGERS AND SUPPORTS

- A. Hanger, support, and anchor products are specified in Section 23 05 29 "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.
 - 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 entire refrigerant system with a vacuum pump to 500 microns Hg. If vacuum holds for 12 hours at ambient temperatures of 60°F, system is ready for charging.
 - 3. Break vacuum with refrigerant gas, allowing pressure to build up to 2 psig.
 - 4. 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 but not limited to:
 - 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, other applicable NY State and Federal Regulations.

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 2014 NYC Building Code, Section 1108.4
- B. Submit final report to the Commissioner

END OF SECTION 23 2300

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 and oval ducts and fittings.
3. Sheet metal materials.
4. Duct liner.
5. Sealants and gaskets.
6. Hangers and supports.

B. Related Sections

1. Section 23 05 93 "Testing, Adjusting, and Balancing of Mechanical Systems"
2. Section 23 33 00 "Air Duct Accessories"

1.3 SUBMITTALS 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. Submittals:

1. Documentation indicating that duct systems comply with ASHRAE 62.1-2007, Section 5 - "Systems and Equipment."
2. Documentation indicating that duct systems comply with ASHRAE/IESNA 90.1-2007, Section 6.4.4 - "HVAC System Construction and Insulation."
3. Documentation of work performed for compliance with ASHRAE 62.1-2007, Section 7.2.4 - "Ventilation System Start-Up."
4. 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:

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. Sprinklers.



- e. Access panels.
- f. Perimeter moldings.

F. Welding certificates.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2019, Section 6.4.4 - "HVAC System Construction and Insulation"

1.6 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.

1.7 WARRANTY

- A. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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 AND FLAT-OVAL 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 10 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 must not be allowed without written approval of the Commissioner. Manufacturer's published individual fitting performances must be included in the submittal.
- 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 36°, 3 gores for 37° thru 71°F and 5 gores for 72° thru 90°.
- 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. Diameters 38" round and larger must be provided with flanged connections. Flanged connections may also be used in lieu of slip connections on smaller sizes. 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. Ducts to be painted must have mill phosphatized coating. Refer to architectural drawings and specifications to coordinate sections to be painted.
- 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. Acoustic performance of liners shall be in accordance with ASTM C 423 and ASRM 795, using Type A mounting. Lining density and thickness shall provide for a minimum of NRC=0.75 or lower.
 4. 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.
 5. 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/oval 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 Division 23 Section "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. 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. Outdoor, Supply-Air Ducts: Seal Class A.
 3. Outdoor, Exhaust Ducts: Seal Class C.
 4. Outdoor, Return-Air Ducts: Seal Class C.
 5. Unconditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg (500 Pa) and Lower: Seal Class B.
 6. Unconditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg (500 Pa): Seal Class A.
 7. Unconditioned Space, Exhaust Ducts: Seal Class C.
 8. Unconditioned Space, Return-Air Ducts: Seal Class B.
 9. Conditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class C.
 10. Conditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class B.
 11. Conditioned Space, Exhaust Ducts: Seal Class B.
 12. Conditioned Space, Return-Air Ducts: Seal Class C.

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 Division 23 Section "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 GALVANIZING RESTORATION

- A. Restore galvanizing damaged by welding, scratches, etc., using Z.R.C., no known equal, cold galvanizing compound.

3.9 START UP

- A. Air Balance: Comply with requirements in Division 23 Section "Testing, Adjusting, and Balancing of Mechanical Systems."

3.10 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 to meet R values for compliance with 2016 NYC Energy Conservation Code .
- 2. Transfer Ducts: Fibrous glass, Type I, thickness minimum 1-1/2 inch unless otherwise noted on plans.

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. Control dampers.
 - 4. Fire dampers.
 - 5. Flange connectors.
 - 6. Turning vanes.
 - 7. Duct-mounted access doors.
 - 8. Flexible connectors.
 - 9. High temperature flexible connectors
 - 10. Duct accessory hardware.

1.3 SUBMITTALS 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 shall provide warranty for a period of one year from substantial completion. Warranty shall 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 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



2.5 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.

2.6 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's "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.

2.7 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.

2.8 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.

2.9 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. High Temperature Flexible Fabric Connector: Teflon coated Fiberglass/ Satin Weave
 - 1. Minimum Weight: 17 oz./sq. yd. (810 g/sq. m).
 - 2. Minimum Tensile Strength: 400 grab pounds per Federal Standard 191 Method #5100.
 - 3. Pressures: Suitable for pressure of -10 in wc to +15 inch wc.
 - 4. Service Temperature: Minus 150 to plus 500 deg F.
- H. 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.

2.10 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.

PART 3 - EXECUTION

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 Division 23 Section "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 SUBMITTALS 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, UL listed, and marked for intended use.
- 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 at 40 feet above sea level.
- B. Operating Limits: Classify according to AMCA 99.

1.7 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.

1.8 COORDINATION

- A. Coordinate size and location of structural-steel support members.

1.9 WARRANTY

- A. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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 INLINE CABINET CENTRIFUGAL EXHAUST FAN

- A. General Description
 - 1. Base fan performance at standard conditions (density 0.075 Lb. /ft³).
 - 2. Ceiling mounted applications
 - 3. Performance capabilities up to 3,700 cubic feet per minute (cfm) and static pressure to 1 inches of water gauge
 - 4. Fans are available in nineteen sizes (110 - 3600 unit sizes)
 - 5. Maximum operating temperatures is 130 Fahrenheit (54.4 Celsius)
 - 6. Sound levels as low as 0.8 AMCA sones
 - 7. Fans are UL/cUL listed 507 - Electric Fans



8. Each fan must bear a permanently affixed manufacturer's nameplate containing the model number and individual serial number
- B. Wheel
 1. Forward curved centrifugal wheel
 2. Constructed of galvanized steel or calcium carbonate filled polypropylene
 3. Statically and dynamically balanced in accordance to AMCA Standard 204-05
- C. Motors:
 1. Motor enclosures must be open driproof (ODP), opening in the frame body and or end brackets
 2. Motors are permanently lubricated sleeve bearing type to match with the fan load and furnished at the specific voltage and phase
 3. Motor must be mounted on vibration isolators and be accessible for maintenance
 4. Compatible for use with speed controls
 5. Thermal overload protection
- D. Housing:
 1. Constructed of heavy gauge galvanized steel
 2. Interior must be lined with 0.5 inches of acoustical insulation
 3. Profile as low as 10 ½ inches
- E. Spring Loaded Aluminum Backdraft Damper:
 1. Prevents air from entering back into the building when fan is off
 2. Eliminates rattling or unwanted backdrafts
- F. Outlet
 1. Type of outlet: Square
 2. Duct collar must include an aluminum backdraft damper
- G. Grille
 1. Constructed of high impact polystyrene, plastic must be factory standard.
- H. External Electrical Access:
 1. Eliminates removing the motor pack which saves time on installation
- I. Mounting Brackets:
 1. Fully adjustable for multiple installation conditions
- J. Access Panel:
 1. Once installed must have easy access to internal components
- K. Accessories
 1. Disconnect Switches
 2. Motion sensor
 3. Time Delay Switch
 4. Vibration Kit
 5. Roof discharge: Weathertight aluminum construction, integral bird-screen, built in curb cap which require roof curb.

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 Division 23 Section "Vibration for HVAC Piping and Equipment."
- C. Install units with clearances for service and maintenance.
- D. Label fans according to requirements specified in Division 23 Section "Identification for HVAC Piping and Equipment."

3.3 CONNECTIONS

- A. Duct installation and connection requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors. Flexible connectors are specified in Division 23 Section "Air Duct Accessories."
- B. Install ducts adjacent to fans to allow service and maintenance.
- C. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- D. Connect wiring according to Division 26 Section "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 Division 23 Section "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 3416



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. Square Plaque Ceiling Diffuser
 - 5. Disc Valve Diffuser
 - 6. Drum Louver
- B. Related Sections:
 - 1. Section 08 09 00 "Louvers and Vents" for fixed and adjustable louvers and wall vents.
 - 2. 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 SUBMITTALS 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. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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. Titus
- B. Price Industries
- C. Anemostat
- D. Nailor Hart
- E. Approved Equal

2.2 LINEAR BAR GRILLE INLET AND OUTLETS (LBG-1)

- 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 (CD-2, EG-1, RG-1)

- 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 $\frac{3}{4}$ -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 SQUARE PLAQUE CEILING DIFFUSER (CD-1, RG-2)

- A. Diffuser must be of the sizes and mounting types shown on the plans and outlet schedule.
- B. The diffuser must have an 22-gauge steel face panel that captures a secondary 22-gauge panel. The face panel is removable by means of four hanger brackets. The exposed surface of the face panel must be smooth, flat, and free of visible fasteners.
- C. The face panel must project $\frac{1}{4}$ inch below the outside border of the diffuser backpan. Panels projecting more than $\frac{1}{4}$ inch below the outside border are not acceptable. The back of the face panel must have an aerodynamically shaped, rolled edge to ensure a tight horizontal discharge pattern. A single metal thickness on the edges of the face panel will not be accepted.
- D. The backpan must be one piece precision die-stamped and must include an integrally drawn inlet (welded-in inlets and corner joints are not acceptable). The diffuser backpan must be constructed of 22-gauge steel. The diffuser neck must have a minimum of $1\frac{1}{4}$ -inch depth available for duct connection.
- E. 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.
- F. The manufacturer must provide published performance data for the square panel diffuser. The diffuser must be tested in accordance with ANSI/ASHRAE Standard 70-1991.

2.5 DRUM LOUVER (DL-1)

- A. Diffuser must be of the sizes and mounting types shown on the plans and outlet schedule.
- B. Throw direction must be adjustable horizontally and vertically via a rotatable drum and pivoting blades.
- C. A felt seal must be provided between the drum and border to stop leakage and hold the drum securely in the position selected.



2.6 CURVED BORDER DRUM LOUVER

- A. Supply grilles must be for the mounting type and sizes as shown on the plans and outlet schedule. Outer borders must be 1¼ inches wide and must be constructed of heavy gauge extruded aluminum. Outer borders must be curved to match the specified duct diameter. Corners of the border must be welded and ground smooth to show no visible miter joint.
- B. Screw mounting holes must be countersunk for a neat appearance. Drum must be constructed of heavy gauge extruded aluminum and must rotate a minimum of 25° up and down from center line of the diffuser. Heavy extruded aluminum blades must be individually adjustable. A split vane option must be available for flexibility in directing air patterns and shortening throw if required.
- C. Optional opposed-blade volume damper must be constructed of heavy gauge steel. Damper must be operable from the face of the grille. An optional air scoop extractor must also be available as an option.
- D. The grille finish must be color as selected by Commissioner. 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.

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

SECTION 23 62 46 - PACKAGED VARIABLE-REFRIGERANT-FLOW AIR CONDITIONING SYSTEM

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. Variable refrigerant flow, heat recovery heat pump air conditioning system.

1.3 SUBMITTALS 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.
 2. Capacities:
 - a. Cooling (Btu/h)
 - b. Heating (Btu/h)
 3. Air Flow (CFM)
 4. External Static Pressure (ESP)
 5. Octave Band Sound Power Data
 6. Electrical Data (MCA, MOP, MSC)
 7. Weight (lbs):
 8. 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 each 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 must not be 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 to the City of New York the products specified above ("Customer") that under normal use and maintenance for comfort cooling and conditioning applications such products (the "Products") will be free from defects in material or workmanship. This warranty applies to compressor and all parts only and is limited in duration to ten (10) years from substantial completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER'S

- A. Basis of Design Product: Subject to compliance with requirements, provide Daikin or comparable product by one of the following:
 - 1. Mitsubishi,
 - 2. Trane
 - 3. 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 in 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 must 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 charging 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 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. An alternate 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 with 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, must not be 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 must 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 capacity.
 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 provisions for condensate removal. A safety device or secondary drain pan must be installed by the mechanical contractor to comply with the applicable mechanical code, if an alternate manufacturer is selected.
- 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 a 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 by 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.
- C. 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.
- D. 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.
- E. 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.

F. 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.

G. Control:

1. The unit must have controls provided by 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.

H. Accessories:

1. Remote temperature sensor.
2. Condensate pump.

2.8 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

2.9 REMOTE CONTROLLER

- A. The Remote Controller can provide control for all VRV/VRF indoor units. The remote controller wiring consist 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 60-90°F (0-32°C)
6. Detailed display will reflect room temperature (0-176°F/-17-80°C 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 (0.5°C)
- b. Changeover to heating mode must occur at heating setpoint - 1°F (0.5°C)
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.

2.10 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 of 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 Intelligent Touch Manager 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.
- 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 600F - 900F (160C - 320C).
 10. Display of temperature setpoint information must be configurable for Fahrenheit or Celsius
 11. Display must reflect room temperature 00F - 1760F (-180C - 800C) 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 PIP2 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 0 - 70F (0 - 40C) between cooling and heating setpoints
 - 3) Selectable single setpoint mode



- d. Independent Setup (Cooling) and Setback (Heating) setpoints in the unoccupied mode adjustable to 40 - 950F (5 - 350C)
 - 1) Setup and Setback setpoints must be set outside of the occupied setpoint range
 - 2) The recovery differential must be 40F (default) and adjustable between 2 – 100F
 - 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 position
 - 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/Off
 - 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 in accordance with manufacturer's instructions.
- 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 "Vibration Control for HVAC Equipment and piping".
- C. Install outdoor compressor-condenser components on restrained, spring isolators secured to steel dunnage. Refer to specification section 230548 "Vibration Control for HVAC Equipment and piping".

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 62 46



THIS PAGE INTENTIONALLY LEFT BLANK



SECTION 23 72 00 - AIR-TO-AIR ENERGY RECOVERY 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. Packaged Energy Recovery Ventilator (ERV) furnished by same as VRV system manufacturer incorporating a high-efficiency paper, cross-flow heat exchanger core to provide both sensible and latent heat recovery.
- B. Related Sections
 1. Section 230153 – “Common Motor Requirements for HVAC”
 2. Section 230548 – “Vibration and Seismic Control for HVAC”
 3. Section 237000 – “HVAC Insulation”
 4. Section 233113 – “Metal Ducts”
 5. Section 230593 – “Testing, Adjusting and Balancing of HVAC Systems”

1.3 SUBMITTALS PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

- A. Product Data
 1. Complete fan performance curves for both Supply Air and Exhaust Air, with system operating conditions indicated, as tested in an AMCA Certified Chamber.
 2. Energy wheel core pressure drop, performance data for both summer and winter operation.
 3. CFM, total static pressure, ext. static pressure
 4. Motor ratings, electrical characteristics and motor and fan accessories.
 5. Combined efficiency data per ARI Guideline V-2003 for each model. Data must include RER, COP, Unitary Net Cooling, Unitary EER and CEF.
 6. Material types and gauges of all component pieces and assemblies.
 7. Dimensioned drawings for each type of installation, showing isometric and plan views, to include location of attached ductwork and service clearance requirements.
 8. Wiring Diagrams



9. Estimated gross weight of each installed unit.
10. Installation, Operating and Maintenance manual (IOM) for each model.

B. Operating Instructions:

1. All information provided under shop drawings plus following:
 - a. Installation Instructions
 - b. Operating and Maintenance Instructions
 - c. Recommended Spare Parts
 - d. Dimensional Drawing

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.
- B. Manufacturer must be able to provide evidence of independent testing of the core by Underwriters Laboratory (UL), verifying a maximum flame spread index (FSI) of 25 and a maximum smoke developed index (SDI) of 50 thereby meeting NFPA 90A and NFPA 90B requirements for materials in a compartment handling air intended for circulation through a duct system. The method of test must be UL Standard 723.
- C. All wiring must be in accordance with the National Electric Code (NEC).
- D. The energy recovery cores used in these products must be third party Certified by AHRI under its Standard 1060 for Energy Recovery Ventilators. AHRI published certifications must confirm manufacturer's published performance for airflow, static pressure, temperature and total effectiveness, purge air (OACF) and exhaust air leakage (EATR). Products that are not currently AHRI Certified will not be accepted.
- E. Unit must be Listed under UL 1812 Standard for Ducted Air to Air Heat Exchangers. Some exceptions to UL Listing may apply.
- F. System efficiency must meet or exceed 65% thermal efficiency and 40% enthalpy recovery efficiency.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Unit must be stored and handled according to the manufacturer’s recommendations.
- B. Protect motors, shafts, and bearings from weather and construction dust.

1.7 LIMITED WARRANTY

- A. Manufacturer must warrant the product to free from defects in material or workmanship. This warranty applies to parts only for 18 months from substantial completion.



1.8 EXTENDED WARRANTY

- A. Six-year extended warranty for heat exchanger core and urethane belt drive only from the date of substantial completion, and three years from the substantial completion for the compressor and compressor parts only.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Greenheck
- B. RenewAire
- C. Mitsubishi
- D. Approved Equal

2.2 PRODUCT DESCRIPTION

- A. Manufactured Units
 - 1. Unit must be fully assembled at the factory and consist of an insulated metal cabinet, energy wheel, frost control, filter assembly for intake and exhaust air, supply air blower assembly, exhaust air blower assembly and an electrical control center. All specified components and internal accessories factory installed and tested and prepared for single-point high voltage connection.
- B. Performance
 - 1. The energy recovery ventilator unit must meet the performance parameters as indicated on the mechanical schedule sheet included with Contract Drawings.
- C. Cabinet
 - 1. Materials: Formed double wall insulated metal cabinet, fabricated to permit access to internal components for maintenance.
 - a. Outside casing: 18 gauge, galvanized (G90) steel meeting ASTM A653 for components that do not receive a painted finish.
 - b. Internal assemblies: 18 gauge, galvanized (G90) steel except for motor supports which must be minimum 14 gauge galvanized (G90) steel.
 - 2. Access doors must be hinged.
 - 3. Must have factory-installed duct flanges on all duct openings.
 - 4. Cabinet Insulation: Comply with NFPA 90A and NFPA 90B and erosion requirements of UL 181.
 - a. Materials: Fiberglass insulation. If insulation other than fiberglass is used, it must also meet the Fire Hazard Classification shown below.
 - 1) Thickness: 1 inch (25 mm)
 - 2) Fire Hazard Classification: Maximum flame spread of 25 and smoke developed of 50, when tested in accordance with ASTM C 411.



- 3) Location and application: Full coverage of entire cabinet exterior to include walls, roof and floor of unit. Insulation must be of semi-rigid type and installed between inner and outer shells of all cabinet exterior components.
5. Energy wheel: Energy wheel must be of total enthalpy, rotary air-to-air type and must be an element of a removable energy wheel cassette. The cassette must consist of a galvanized steel framework (designed to produce laminar air flow through the wheel), an energy wheel as specified and a motor and drive assembly. The cassette must incorporate a pre-tensioned urethane drive belt. The wheel media must be a polymer film matrix in a stainless steel framework and be comprised of individual segments that are removable for servicing. Non-segmented energy wheels are not acceptable. Silica gel desiccant must be permanently bonded to the polymer film and must be designed and constructed to permit cleaning and servicing. Performance criteria are to be as specified in AHRI Standard 1060, complying with the Combined Efficiency data in the submittal.
6. Supply Air and Exhaust Air blower assemblies: Blower assemblies consist of an electric motor and a belt driven blower. Assembly must be mounted on heavy gauge galvanized rails and further mounted on 1.125 inch thick neoprene vibration isolators.
7. Control panel / connections: Energy Recovery Ventilator must have an electrical control center where all high and low voltage connections are made. Control center must be constructed to permit single-point high voltage power supply connections.
8. Frost control: Timed exhaust.
9. Timed exhaust must be provided for frost control of the energy wheel. Control system must include an outdoor air thermostat and pressure sensor on the wheel assembly to initiate frost control sequence

D. Blower

1. Blower section construction, Supply Air and Exhaust Air: Belt drive motor and blower must be assembled onto a 14 gauge galvanized steel platform and must have neoprene vibration isolation devices.
2. Blower assemblies: Must be statically and dynamically balanced and designed for continuous operation at maximum rated fan speed and horsepower.
3. Centrifugal blower housing: Formed and reinforced steel panels to make curved scroll housing with shaped cutoff.
4. Forward curved blower (fan) wheels: Galvanized or aluminum construction with inlet flange and mustow blades curved forward in direction of airflow. Mechanically attached to shaft with set screws.
5. Blower performance must be factory tested for flow rate, pressure, power, air density, rotation speed and efficiency. Ratings are to be established in accordance with AMCA 210, "Laboratory Methods of Testing Fans for Rating".

E. Motors

1. General: Blower motors greater than 3/4 horsepower must be "NEMA Premium" unless otherwise indicated. Minimum compliance with EPA's minimum energy-efficiency standards for single speed ODP and TEFC enclosures is not acceptable. Motors must be heavy-duty, permanently lubricated type to match the fan load and furnished at the



specified voltage, phase and enclosure. Drives must be sized for a minimum of 150% of driven horsepower and pulleys must be fully machined cast-type, keyed and fully secured to the fan wheel and motor shafts. Electric motors of ten horsepower or less must be supplied with an adjustable drive pulley. Comply with requirements in Section 230513 – Common Motor Requirements for HVAC Equipment, matched with fan load.

2. Fan motors must be 60 cycle, 3 phase 208 volts.

F. Filters

1. Unit must have permanent metal filters located in the outdoor air intake and must be accessible from the exterior of the unit. MERV 13 disposable pleated filters must be provided in the intake air stream and MERV 8 filters in the exhaust air stream.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 UNIT LOCATION AND PLACEMENT

- A. Locate and orient unit to provide the shortest and most straight duct connections as noted on plans. Provide service clearances as indicated on the plans.
- B. Use proper rigging, including spreader bars, for safe lifting and placement.
- C. Provide flexible duct connections at unit duct flanges.
- D. Provide spring type isolators appropriately sized for unit weight.

3.3 DUCT DESIGN

- A. All ductwork must be designed, constructed, supported and sealed in accordance with SMACNA HVAC Duct Construction Standards and pressure classifications.
- B. Both the return and the supply ducts must be thermally insulated indicated on plans and at minimum in compliance with NYCECC. A continuous vapor barrier must also be provided on surface of the insulation.

3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory authorized service representative to inspect field assembled components and equipment installation, to include electrical and piping connections. Report results to Commissioner in writing. Inspection must include a complete startup checklist to include (as a minimum) the following: Completed Start-Up Checklists as found in manufacturer's IOM.



3.5 STARTUP SERVICE

- A. Engage a factory authorized service representative to perform startup service. Clean entire unit, comb coil fins as necessary, and install clean filters. Measure and record electrical values for voltage and amperage. Refer to Division 23 "Testing, Adjusting and Balancing for HVAC" and comply with provisions therein.

3.6 TEST AND BALANCING

- A. Test and Balancing may not begin until 100% of the installation is complete and fully functional.
- B. Follow National Comfort Institute (NCI) air test and balance procedures specific to Heat Recovery Ventilator Balancing Procedure including standard reports to the Commissioner.

3.7 INSTALLATION

- A. Do not operate fans for any purpose until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.

END OF SECTION 23 72 00



SECTION 23 82 00 - CONVECTION HEATING AND COOLING 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. Unit Heater
 - 2. Ceiling Mount Air Curtain
 - 3. Pedestal Mount Baseboard Heater
 - 4. Trench Heater
 - 5. Wall Fan Heater
 - 6. Toe-kick Heater

1.3 SUBMITTALS PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 SUBMITTALS

- A. Submit the following in accordance with the requirements specified under Submittals in Section 23 0500.
 - 1. Product Data
 - a. Submit copies of manufacturer's latest published literature for materials specified herein for approval, and obtain approval before materials are delivered to the site.
 - b. Data shall include manufacturer's specifications for terminal units showing dimensions, capacities, ratings, performance characteristics, gauges and finishes of materials, and installation instructions.
 - 2. Shop Drawings: Shop drawings for work specified herein shall be submitted for approval. Shop drawings shall show assembly-type drawings showing unit dimensions, construction details, and field connection details.
 - 3. 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.
 - 4. Samples: Submit 3 samples for each type of cabinet finish furnished.



5. 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 shall comply with the latest edition of application codes, recommended practices, and standards of NEC, NEMA and U.L.

1.6 WARRANTY

- A. Manufacturer shall provide warranty for a period of two years from substantial completion. Warranty shall 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 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 shall 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.

PART 2 - PRODUCTS

2.1 UNIT HEATER (EH-1)

- A. Furnish and install where indicated on plans, unit heaters, suitable for continuous operation as manufactured by Stelpro, QMark, Berko or approved equal. Heaters shall be UL listed.
- B. Enclosure: The heaters shall be fabricated of minimum 20 gauge steel cabinet with epoxy-polyester powder coat finish. Standard color shall be charcoal
- C. Heating Element: The heating element wire shall consist of 80% nickel, 20% chromium.
- D. Fan and Motor: Helicoidal fan, totally enclosed factory lubricated motor, adjustable louvers to adjust airflow direction.
- E. Control: Integral disconnect switch and built-in thermostat.
- F. Heaters shall be designed to permit use of supply conductors with 60°C insulation.



- G. Protection: Linear thermal cut-out shall be factory installed to automatically shut off heater in event of overheating and reactivate heater when temperatures return to normal. The complete heater shall have a height of 6-3/4 inches and a depth of 2-7/8 inches.
- H. Mounting: Wall or ceiling mount with factory furnished universal mounting bracket

2.2 CEILING MOUNT AIR CURTAIN (EH-2)

- A. Furnish and install where indicated on plans ceiling mount air curtain heater suitable for continuous operation as manufactured by Stelpro, QMark, Berko or approved equal. Heaters shall be UL listed.
- B. Enclosure: The heaters shall be fabricated of minimum 22-gauge steel cabinet with epoxy-polyester powder coat finish, constructed for easy access for maintenance. Standard color shall be white / soft white. Custom color as selected by Commissioner.
- C. Heating Element: The heating element wire shall consist of 80% nickel, 20% chromium.
- D. Fan and Motor: Propeller fan, factory lubricated motor.
- E. Control: Integral disconnect switch and tamper proof built-in thermostat.
- F. Heaters shall be designed to permit use of supply conductors with 60°C insulation.
- G. Protection: Linear thermal cut-out shall be factory installed to automatically shut off heater in event of overheating and reactivate heater when temperatures return to normal. The complete heater shall have a height of 6-3/4 inches and a depth of 2-7/8 inches.
- H. Mounting: Recessed ceiling mount recommended height 8 feet, maximum 9 feet.

2.3 PEDESTAL MOUNT BASEBOARD HEATER (EH-3)

- A. Furnish and install where indicated on plans wall or pedestal mount electric baseboard heaters, suitable for continuous operation as manufactured by Indeeco, QMark, Berko or approved equal. Heaters shall be UL listed.
- B. Housing: Cabinet is constructed of 18-gauge steel with a 14-gauge aluminum front and top covers. The unit has an epoxy/polyester powder paint finish in white or almond. End caps shall be provided on all units.
- C. Heating Elements: Stainless steel elements with aluminum fins float on high temperature nylon bushings for quiet operation.
- D. Inlet / Outlet Grilles: The fresh air inlet is located on the bottom of the unit. The top outlet grille has openings less than 0.25 inches to discourage tampering with the heating element (pencil-proof).
- E. Safety Controls: Linear limit, automatic reset thermal cutout.
- F. Control: Field installed low voltage relay and thermostat kits shall fit into the right-hand junction box only.



- G. Thermostat: Disconnect switch and built-in double pole thermostat.
 - H. Electrical: Each heater has a junction box located at the right end and a built-in full length wireway. Separate low voltage wireway shall be available.
 - I. Installation Options: Provide pedestal kits and smooth painted finish back plate.
 - J. Mounting Requirements: – Minimum installation height above the floor is two inches.
- 2.4 TRENCH HEATER (EH-4)
- A. Trench heater shall be cross-flow fan-assisted convector heating duct with electric heating element.
 - B. Housing: Sendzimir galvanized steel duct, painted graphite grey, lateral height adjustment feet and raised floor feet with sound insulation; with transverse internal reinforcing brackets and pre-punched openings for electrical connections with cover plate over the connection area including ventilation slots. Housing shall be extended to accommodate the local disconnect switch.
 - C. Crossflow (Tangential) fan with compact EC motor, robust construction with finger guard, continuous speed control via an external 0-10V signal. Motor monitoring with factory wired internal fault processing.
 - D. Electric heating element made from stainless steel pipe with aluminum/zinc fins, with mounting plate (brackets). With air guide walls and separation sheet to avoid a short circuit between air inlet and leaving air.
 - E. Control box with integral output control, factory-fitted and wired for connection of room thermostat.
 - F. Provide disconnect switch within backbox and secured within the housing.
 - G. High-limit 2-stage safety switch consisting of: safety thermostat which switches itself on again automatically and temperature fuse that switches the unit off and locks it.
 - H. With double-T profile roll-up grille with fixings, linked on corrosion-proof steel springs with matching spacers; with frame profile to match the grille. Free area: approx 65%.
 - I. Ensure all electric trench units are certified against ETL certification standards.
- 2.5 WALL FAN HEATER (EH-5)
- A. Furnish and install where indicated on plans wall mount air curtain heater suitable for continuous operation as manufactured by Stelpro, QMark, Berko or approved equal. Heaters shall be UL listed.
 - B. Enclosure: The heaters shall 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 shall be white / soft white. Custom color as selected by the Commissioner.



- C. Heating Element: The heating element wire shall consist of 80% nickel, 20% chromium.
- D. Fan and Motor: Propeller fan, factory lubricated motor.
- E. Control: Integral disconnect switch and tamper proof built-in thermostat.
- F. Heaters shall be designed to permit use of supply conductors with 60°C insulation.
- G. Protection: Linear thermal cut-out shall be factory installed to automatically shut off heater in event of overheating and reactivate heater when temperatures return to normal. The complete heater shall have a height of 6-3/4 inches and a depth of 2-7/8 inches.
- H. Mounting: Wall mount, recessed or surface mount. Provide adapter for surface mount installation.

2.6 KICK SPACE HEATER

- A. Furnish and install where indicated on plans wall mount air curtain heater suitable for continuous operation as manufactured by Stelpro, QMark, Berko or approved equal. Heaters shall be UL listed.
- B. Enclosure: The heaters shall be fabricated of minimum 22-gauge steel cabinet, 16 gauge steel steel front, epoxy-polyester powder coat finish or stainless steel, constructed for easy access for maintenance. Standard color shall be white / soft white. Custom color as selected by the Commissioner.
- C. Heating Element: Tubular element sheathed with spiral-wound fins for improved heat dissipation.
- D. Fan and Motor: Factory lubricated motor.
- E. Control: Integral disconnect switch and tamper proof built-in double pole thermostat.
- F. Heaters shall be designed to permit use of supply conductors with 60°C insulation.
- G. Protection: Fuse-link that will need to be replaced once activated
- H. Mounting: Recessed installation in millwork

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 heaters as indicated, and in accordance with manufacturer's installation instructions.
 - 2. Locate heaters as indicated, coordinate location with Commissioner and with other trades. Ensure that required clearance are maintained to combustible construction.
 - 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 Electric trade.
 - 2. Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements of Division 26 sections. 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 00



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. Provide all labor, materials, supplies, tools, machinery, equipment, scaffolding, transportation, rigging, storage, utilities, supervision and all required permits and licenses necessary to complete the electrical work under this contract. The Contractor must, consult with representative of the utility company to determine the extend of his work regarding the electrical service and their requirements for installation of same. The complete installation must be in accordance with the requirements of the utility company, 2014 NYC Building Code, NYC Electrical Code and NFPA.
- B. Provide a complete working electrical installation with all equipment called for in proper operating condition. Documents do not undertake to show or list every item to be provided. When an item not shown or listed is clearly necessary for proper operation of equipment that is shown or listed, provide the item, which will allow the system to function properly at no increase in Contract Price.
- C. Coordinate the electrical work with the work of the other trades so as to resolve conflicts without impeding job progress or the construction schedule.
- D. Examine all the Contract Documents in order to determine the extent of the Work required to be completed under this Section. Failure to examine all the Contract Documents for this project will not relieve this contractor of the responsibility to perform all the Work required for a complete, fully operational and satisfactory installation.

1.3 SUBMITTALS PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

- A. Submit detailed and fully coordinated shop drawings showing all conduit routes, equipment with nameplate, devices and pull boxes for each floor including all the Electrical Rooms. The Electrical Rooms must be shown with large-scale layout shop drawings.
- B. Submit manufacturer’s data, shop drawings and samples as noted of all proposed equipment including but not limited to the following:



Cable Identification Tags (include sample)	Disconnect switches
Current Transformer Cabinets	Circuit Breakers
Fire Alarm System	Fuses
Wires and Cables (include sample)	
Lighting Control System	Receptacles (include sample)
Equipment/Devices Name Plates (include sample)	Panelboards
Fireproofing (include sample)	Conduits
Cable Supports(include sample)	Lamps
Metering System	
Grounding Equipment	Wiring Devices (include sample)
Floor Boxes and Junction Boxes	Conduit Fittings
Emergency Lighting System	Receptacle Plates (include sample)
Switch plates (include sample)	
Nameplates (include sample)	

- C. Submit detailed and fully coordinated large-scale layout shop drawings showing the sections of all congested areas to show relative position and spacing of the effected elements.
- D. The large-scale layout shop drawings must be a minimum of 1 / 4 in. equal to 1 ft. scale.
- E. Submit calculations where required by the Specifications or the Contract Drawings.
- F. Submit detail designs for seismic restraint and support for conduits and equipment. The designs must be certified and sealed by a Professional Engineer licensed in the State of New York.
- G. Submit certified test reports and trip setting of overcurrent and overload devices where required by the Specifications or the Contract Drawings.
- H. All symbols and designations used in preparing Record and Coordination Drawings must match those used in the Contract Drawings.
- I. Prior to Final Acceptance, the following data must be furnished to the Commissioner.
 - 1. Record Drawings.
 - 2. Coordination Drawings
 - 3. Operation and Maintenance Manuals
 - 4. Manufacturer's Data of the equipment and devices installed

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. All workers performing under this Division must be skilled workers of the trade involved. Where specialty work, such as splicing or welding are required, submit proof of certification, experience, and work history for each worker, for review by the Commissioner.



- C. All electrical materials and equipment for which there is a nationally recognized standard must bear the conformance labeling of the third party inspection authority, such as Underwriters Laboratories Inc., Factory Mutual, ETL or other recognized agency listed, in accordance with the requirements of 2014 NYC Building Code, NYC Electrical Code and NFPA
- D. Asbestos or items containing asbestos must not be furnished or installed.
- E. All calculations required by this and other various Sections of these Specifications, or as shown on the Drawings, must be certified and sealed by a Professional Engineer licensed in the state of New York, and must be submitted to the Commissioner for review.
- F. With the exceptions as specified and/or indicated on the Drawings or in the Specifications, the Contractor must apply, install, connect, erect, use, clean, commission and condition manufactured articles, materials, and equipment per Manufacturer's current printed instructions and recommendations. Copies of such printed recommendations must be kept at the Project site and made available as required.
- G. Where the manufacturer's recommendations conflict with the Contract Documents, the conflict must be brought to the Commissioner's attention immediately.

1.6 WORK INCLUDED

- A. The Work includes but is not limited to the following systems, equipment, and services:
 - 1. All work associated with the new incoming electrical services.
 - 2. Service equipment, and Utility Company electric metering provisions.
 - 3. Service equipment, distribution panelboard and panelboards for lighting and power.
 - 4. Feeders, sub-feeders, and branch circuiting for light, power and control wiring, including connections to all service equipment, panelboards, motor control equipment, disconnect devices, outlets and equipment included in these Specifications or indicated on contract drawings.
 - 5. Furnishing and installation of lighting equipment, lighting fixtures, lamps, contactors, lighting control systems, etc.
 - 6. Installation and testing of lighting equipment and controls.
 - 7. A complete electrical grounding system.
 - 8. Fire Alarm / Life Safety System as specified under Section 284600 "Fire Detection and Alarm".
 - 9. Testing and Balancing Loads.
 - 10. Installation and wiring of individual motor controllers provided by other trades.
 - 11. Connection of all motors, equipment, interlocks, safety devices, and other components including all motor controllers.
 - 12. Furnishing and installing all interlock wiring not provided by Section 230900 "Instrumentation and Controls for HVAC".
 - 13. Labor and/or standby assistance in commissioning the control and instrumentation systems provided by Section 230900 "Instrumentation and Controls for HVAC".
 - 14. Wiring and connection to all conveying systems equipment being provided under Division 26.
 - 15. Connection of all equipment furnished under other Divisions and/or by the City of New York.
 - 16. Remove the protective coverings on the lighting fixtures when required by the heating, ventilating and air conditioning air balancing subcontractor.



17. Miscellaneous items as required for complete and functioning systems as specified herein and indicated on the Drawings.
18. Provide all excavation and back-fill required for Division 26 Work.
19. Supports, vibration isolation and seismic restraint devices.
20. Furnish and set all sleeves complete with seals and firestops as specified herein for the passage of conduit, etc. through structural steel, decking, masonry and concrete walls and floors, drywall construction, any other rated construction assembly, and elsewhere as will be required for the proper protection of each raceway and passing through a wall, floor, etc. Coordinate the work with the work of other Trades in order to properly expedite and perform the work. Furnish shop drawings showing the size and location of all required holes through the concrete floors and walls.
21. Participate in and assist in the testing, operation and commissioning of all electrically powered equipment as required during the performance testing and startup of the work of other Sections. Refer to other Sections for additional requirements.
22. Instruments as required for operating and testing the various systems must be furnished and installed complete as specified herein.
23. The Commissioner must be fully instructed regarding operation and maintenance of the entire installation and complete printed or typed instruction booklets must be provided covering maintenance, operation, and adjustment of each piece of equipment. Spare parts lists for each piece of equipment must be furnished.
24. Provide smoke detector elements in the ductwork in cutouts provided under another Section of the Specifications. Closely coordinate the installation of all smoke detector elements with the work of the Heating, Ventilating and Air Conditioning Division of the Contract Documents.
25. Patching or replace all fireproofing if it is damaged or removed during the installation of the Electrical Work
26. Coordinate access door locations.

1.7 GUARANTEE

- A. Submit a single guarantee stating that all portions of the work are in accordance with Contract Documents. Warrant all work against faulty and improper material and workmanship for a period of one year from date of substantial completion, except that where guarantees or warranties for longer terms are specified herein, such longer term must apply. At no additional cost to City of New York, within 24 hours after notification, correct any deficiencies which occur during the warranty period (including all parts, material, labor), all to the satisfaction of the Commissioner
- B. During the guarantee period, the Contractor must guarantee the following in a form satisfactory to the Commissioner:
 1. All equipment will develop capacities and performance characteristics specified.
 2. The systems must operate without malfunction.

1.8 SPACE CONSTRAINT

- A. The equipment selections used in the preparation of the Contract Documents will fit into the physical spaces provided and indicated, allowing ample room for access, servicing, removal and replacement of parts, etc. Adequate space must be allowed for clearance in accordance



with Code requirements, , 2014 NYC Building Code, NYC Electrical Code, NFPA and the equipment manufacturer's recommendations.

- B. In the preparation of Drawings, a reasonable effort to accommodate acceptable equipment manufacturer's space requirements has been made. However, since space requirements and equipment arrangement vary according to each manufacturer, the responsibility for initial access, maintenance access, code required access, and proper fit rests with the Contractor.
- C. Physical dimensions and arrangements of equipment to be installed must be subject to the Commissioner's review.
- D. Wherever possible, electrical equipment distribution and branch lines must be installed tight to structure.

1.9 DRAWINGS AND COORDINATION WITH WORK OF OTHER TRADES

A. Contract Drawings

- 1. Drawings are essentially diagrammatic, intended to convey the scope of work and to indicate the desired location or arrangement of equipment, devices, conduit runs, outlets, etc and are to be followed as closely as possible. Judgment must be exercised in executing the Work so as to secure the best possible installation in the available space and to overcome local difficulties due to space limitation or interference with structural conditions.
- 2. Drawings indicate, diagrammatically, the routes of duct banks and conduit system, unless specifically dimensioned, and do not indicate the required pull boxes, cable support boxes, fittings, seismic restraint, supports or similar items required for a complete system
- 3. Exact routing of wiring and locations of outlets, panels, equipment, devices, luminaires, etc., must be governed by structural conditions, obstructions and existing conditions. Commissioner reserves right, at no increase in cost, to make any reasonable change in locations of electrical items, exposed at ceiling and/or on walls, to group them into orderly relationships and/or increase their utility.
- 4. The Contractor must follow the Drawings in laying out the Work and check drawings of all trades to verify spaces in which Work will be installed. Maintain maximum headroom in all areas. Where space conditions appear inadequate, the Commissioner must be notified before proceeding with the installation.
- 5. Locations shown on Architectural Reflected Ceiling Drawings, Architectural Floor Plans or on wall elevations must take precedence over electrical plan locations. For setting out of devices, the Contractor must refer to the Architectural Drawings.

B. Coordination:

- 1. Work out all "tight" conditions involving Work under this Division and Work in other Divisions in advance of installation. If necessary, and before Work proceeds in these areas, prepare supplementary Drawings under this Division for review, showing all Work in "tight" area. Provide supplementary Drawings and additional Work necessary to overcome "tight" conditions.
- 2. Carefully check space requirements with other Sections of the Contract Documents to ensure that all material can be installed in the spaces allotted thereto.



3. Transmit to other Trades information required for work to be provided under other Sections such as space for access to pull boxes, cable support boxes, control wiring and connections, access doors in ample time for installation.
4. All Trades must coordinate the installation of equipment, conduit, ductwork, piping, cable, cable trays, etc., with the installation of luminaires, special ceiling construction, air distribution equipment and the structure. Provide additional rises, drops, offsets and pullboxes as required. If, after installed, new conduit, ductwork, piping or cable is found to be in conflict with the architecture, structure, or other trade Work which is either existing or shown on the Contract Documents, the conduit, ductwork, piping or cable must be relocated without additional cost to the City of New York
5. Wherever work interconnects with work of other Sections, coordinate this work to ensure that other Sections are advised of the information necessary so that they may properly install all the necessary connections and equipment. Identify all work items in an approved manner in order that the work of other Sections may know where to install access doors and panels.
6. Furnish and set all sleeves for passage of the electrical service and distribution, and telecommunication services through structural masonry and concrete walls and floors and elsewhere as will be required for the proper protection of each conduit passing through building surfaces. Coordinate this work with the Commissioner in order to properly expedite and perform this work and provide fireproofing in accordance with these Contract Documents.
7. A planned sequence of operation is required to properly install the complete systems. It must be the responsibility of this Section to coordinate, protect and schedule its work with other Sections in accordance with the construction sequence.
8. Architectural drawings must be checked for ceiling height requirements. Where no ceiling height is stated, request direction from Commissioner prior to commencing work.
9. Field drilling, cutting and/or reinforcing of holes in structural metal deck required for work under this Section must be coordinated and approved by the Commissioner. All such drilling, cutting and reinforcing costs must be included as work of this Section of the Contract Documents.
10. Coordinate electrical power and control wiring requirements of mechanical equipment with Division 23.
11. Coordinate electrical power and control wiring requirement of Building Management System with Section 230900 "Instrumentation and Controls for HVAC".
12. Equipment rough-in locations shown on the Drawings for equipment furnished by City of New York and for equipment furnished under other Divisions are approximate only. Obtain exact rough-in locations from following sources:
 - a. From shop drawings for Contractor-furnished and installed equipment.
 - b. From Commissioner for City of New York-furnished Contractor-installed equipment.
13. Where conflict exists between rough-in shown on drawings and that shown or required by equipment to be installed, obtain clarification from Commissioner and provide rough-in as directed.
14. Provide templates, information and instructions to other Divisions to properly locate holes and openings to be cut or provided for the Work.
15. The Contractor must cooperate and confer with other trades as to locations of their materials and equipment before erecting work, so as to avoid interference as much as possible, and in such a manner that will in no way retard progress of construction. In the event that interferences develop, the Commissioner's decision will be final as to which



- Division must relocate its work, and no additional compensation will be allowed for the moving of piping, ductwork, conduit or equipment to clear such interferences.
16. Coordinate with the Con Edison for service connections and provide all necessary materials, labor and testing.
 17. Furnish to appropriate trades, shop drawings, catalog sheets and instructions necessary for construction of concrete bases, concrete encasement, anchor bolts, and other construction required to accommodate installations under other Sections.
 18. Before installing electrical work, all pertinent drawings must be studied and precise information obtained from the architectural schedules, scale drawings, large scale and full size details of finished rooms, reviewed shop drawings or from the Commissioner. It must be understood that even after all the coordination there may be cases where some electrical work, due to the unforeseen site conditions, may required to be relocated within 10 feet from the location shown. In such cases, the contractor must relocate the electrical work if so directed by the Commissioner at no increase in cost. Make any necessary adjustment of the work to fit conditions for luminaires, switches, Fire alarm devices and floor outlets occurring in wood paneling or other special finish material in order that all boxes must be flush with finish and be centered properly. In centering outlets make due allowance for overhead piping, ducts, window and door trim, variations in thicknesses of furring, plastering, etc., as erected, regardless of conditions which may be otherwise shown on small scale drawings. Electrical work incorrectly located must be properly relocated without expense to the City of New York
 19. Locate local switches which are shown near doors at the strike side of the door, unless specifically noted on plans to be beyond the open door.
 20. In Mechanical, Electric and Communications Rooms, etc., light fixture arrangement must be adjusted to suit the final coordinated equipment, duct, conduits, racks and piping, layouts. Fixtures must be mounted approximately 9 feet 0 inches above the finished floor, unless otherwise noted on the Drawings.
 21. Coordinate all components and aspects of the work, in order to minimize power shutdowns to the power distribution systems. Should any part of the Work require an "off-hours" shutdown, supply temporary services or feeders to maintain operation of the existing systems and equipment.

PART 2 - PRODUCTS

2.1 IDENTIFICATION

- A. All major components of the electrical distribution system and parts of equipment, such as service equipment, panelboards, safety switches, motor starters, circuit breakers, time clocks, contactors, relays, pull and junction boxes, control boxes/panels, troughs, etc and similar items must be identified by name, source of power or circuit origin, load served, voltage, number of phases, current rating and frequency. Where equipment or devices, such as transfer switches and relays, are powered from two sources, both normal and emergency must be identified with the required information.
- B. All major components of the Fire Alarm System, such as Main control panel, data gathering panels, fan shut down control panels, must be identified by the designations indicated on the contract drawings.



- C. Equipment must be identified by means of nameplates fastened to the equipment with brass plate screws. Nameplates for the Normal Power Distribution System must be black surface, white core laminated bakelite with engraved letters. Nameplates for the Fire Alarm System must be Red surface, white core laminated bakelite with engraved letters.
- D. All nameplates must be a minimum of 2 in. wide by 4 in. long with engraved white letters 1/4 in. high except for major Fire Alarm System and Electrical Distribution System, such as panelboards, distribution boards, pull boxes, dimming system, a minimum of 3 in wide by 6 in long with one inch high letters must be used.
- E. Identify each outlet box, junction box, pull box, cabinet for emergency and fire alarm circuitry by red paint. In addition to the red paint, boxes for fire alarm circuitry must have the black 1 inch “FA” lettering.
- F. Circuits and pull wires must have tags attached to them at junction boxes, panelboards, pull boxes, relays, support boxes. Tags must be made of pressure sensitive tape or embossed self-attached ribbon. Feeder or branch circuit numbers and origin and equipment/devices served must be indicated on the tag. All cables, No. 3 and larger, must be identified with engraved cable markers indicating the required information. at all pull boxes, support boxes and terminal devices.
- G. Nomenclature must be according to a schedule approved by the Commissioner. Nameplates and tag symbol must correspond to the identification on the contract Drawings and on the Record Drawings.
- H. Cardholders and directory cards must be provided for circuit identification in panelboards. Cardholder must be located and permanently attached on the inside of panelboard door and must be plastic frame with clear lexan front. Directory cards must be typewritten. Circuit descriptions must include specific floor and unit designations as indicated on floor plans and schedules for all equipment served.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 SEISMIC REQUIREMENT

- A. Seismic restraints for equipment, conduits, devices, luminaries, equipment housekeeping pads and equipment supports must be provided and must comply with the latest 2014 NYC Building Code.
- B. Seismic restraint design must be certified and sealed by a Professional Engineer licensed in the State of New York.



3.3 PENETRATIONS

- A. Avoid, if possible, the penetration of any waterproof membranes such as roofs, machine room floors, basement walls, and the like. If such penetration is necessary, perform it prior to the waterproofing and furnish all sleeves or pitch-pockets required. Advise the Commissioner and obtain written permission before penetrating any waterproof membrane, even where such penetration is shown on the Drawings.
- B. If Contractor penetrates any walls or surfaces after they have been waterproofed, the Contractor must restore the waterproof integrity of that surface as directed by the Commissioner at his own expense.
- C. Pack space between conduits, sleeves, and seal unused sleeves in non-fire rated walls with non-combustible materials.
- D. Conduit enters the building through a concrete foundation wall below grade level, a watertight entrance seal must be used. The seal must be by OZ/Gedney, Thomas and Betts, Appelton, approved equal.
- E. Make penetrations through floors, walls and any damp-proofed/water-proofed surfaces, damp-proof/waterproof by appropriate means to maintain integrity of system penetrated.
- F. Seal around penetrations and between conduits, sleeves, and seal unused sleeves, in fire rated walls with UL listed fireproofing material to maintain integrity fire rating.
- G. The Contractor is responsible for the timely placing of sleeves for all piping passing through walls, partitions, beams, floors, and roofs, while the same are under construction.

3.4 EXPANSION AND DEFLECTION

- A. Equip all and conduits, including those embedded in concrete, which cross building expansion or control joints, with expansion fittings.
- B. Where conduits are subjected to expansion and movement in any directions or to vibration transmitted by equipment or vehicular traffic, install a combination expansion and deflection fittings.

3.5 SUPPORT

- A. Provide required supports and hangers for conduit and equipment, so that loading will not exceed allowable loadings of structure.
- B. The design of the supports for conduits, and equipment must be certified and sealed by a Professional Engineer licensed in the State of New York.
- C. Where conduits are routed vertically through shafts, the Contractor must provide and install all necessary miscellaneous structural members to support the loads imposed by the risers.



- D. Where equipment (transformers, conduit racks, etc.) are supported from structural slabs, the Contractor must provide all miscellaneous structural members to support the load plus a 250 lb. live load.
- E. The Contractor must submit Shop Drawings of the riser support system inside vertical shafts to the Commissioner for approval, including details of how the riser support structure is to be attached to the building structure
- F. Miscellaneous structural support members installed in Electrical Room, electric closet, Mechanical Rooms, and where exposed to public view must be galvanized.
- G. Include supporting frames or racks extending from floor slab to ceiling slab for work indicated as being supported from walls where the walls are incapable of supporting the weight. In particular, provide such frames or racks in electric closets.
- H. Include supporting frames or racks for equipment, intended for vertical surface mounting, which is required in a freestanding position. Supporting frames or racks must be of standard angle, standard channel or specialty support system steel members. They must be rigidly bolted or welded together and adequately braced to form a substantial structure. They must be firmly secured to the floor slab with expansion anchors designed to support the system and the equipment. Racks must be of ample size to assure a workmanlike arrangement of all equipment mounted on them and must not impinge code required work space of other equipment, devices, access panel, junction boxes, pull boxes, etc.
- I. Wall mounted equipment may be directly secured to wall by means of steel bolts. Maintain at least 1" air space between equipment and supporting wall. Groups or arrays of equipment may be mounted on adequately sized steel angles, channels, or bars. Prefabricated steel channels providing a high degree of mounting flexibility, such as those manufactured by Kindorf, Glob-Strutt and Unistrut or approved equal, may be used for mounting arrays of equipment.
- J. Nothing, including outlet, pull and junction boxes and fittings, must depend on electric conduits, raceways, or cables for support, except that threaded hub type fittings having a gross volume not in excess of 100 cubic inches may be supported from heavy wall conduit, where the conduit in turn is securely supported from the structure within five inches of the fitting on two opposite sides.
- K. Nothing must rest on, or depend for support on, suspended ceilings media (tiles, lath, plaster, as well as splines, runners, bars and the like in the plane of the ceiling). If suspended ceilings are used to support lighting fixtures, they must be designed to support the weight of the fixtures. Branch circuit conduit up to 3/4" may be permitted to be supported from ceiling hanger rods if the allowable loading of the rods is not exceeded and approved by the Commissioner.
- L. For items which are shown as being ceiling mounted at locations where fastening to the building construction element above is not possible, provide suitable auxiliary channel or angle iron bridging, tying to the building structural elements.

3.6 DISSIMILAR METALS

- A. Dissimilar metals must mean those metals which are incompatible with one another in the presence of moisture. Where dissimilar metals come in contact, paint the joint both inside and



out with approved coating so as to exclude moisture from the joint, or provide a suitable insulating barrier separating the metals.

- B. Transitions in raceways, from one metal to a dissimilar metal must only be made at boxes or other enclosures.

3.7 CUTTING, PATCHING, SLEEVES

- A. The work must be carefully laid out in advance. Where cutting, channeling, chasing or drilling of floors, walls, partitions, ceilings or other surfaces is necessary for the proper installation, support or anchorage of raceway, outlets or other equipment, the work must be carefully done and where required, fire rating integrity must be restored. Any damage to the piping, equipment or defaced finish plaster, woodwork, metalwork, etc. must be repaired by skilled mechanics of the trades involved at no additional cost to the City of New York.
- B. The Contractor must do no cutting, channeling, chasing or drilling of unfinished masonry, tile, floor slab, etc., unless the Contractor first obtains permission from the Commissioner. If permission is granted, the Contractor must perform this work in a manner approved by the Commissioner.
- C. If holes and/or sleeves are not properly installed and cutting and patching becomes necessary, it must be done at no additional expense to the City of New York. The Contractor must undertake no cutting or patching without first securing the Commissioner's written approval.
- D. Where other Trades are required to do cutting and patching, furnish to the Commissioner necessary information so that openings for this work can be built into the floors and walls in time. Such cooperation is required to keep cutting of walls and floors to a minimum.
- E. Should Contractor neglect to perform preliminary work, and should cutting be required in order to install equipment, conduits, etc, the expense of this cutting and restoring of surfaces to their original condition must be borne by the Contractor.

3.8 PAINTING

- A. Equipment furnished under this Section must have factory-applied finish. If the factory finish is damaged during shipment, storage, installation, etc., it must be repainted by this Contractor subject to the Commissioner's approval. Touch-up painting is acceptable only for minor finish damage.
- B. Provide a heavy field coat of black asphaltum paint on all steel conduits, cradles, vibration isolating mounts, and the like, that will be encased or partially encased in building construction, set in cement or fill, before items are built into the general construction.
- C. Where conduits, mounting channels, outlet, junction, or pull boxes are mounted on a painted surface, or a surface to be painted they must be painted, by the contractor, to match the painted surface.



3.9 CLEANING UP

- A. Contractor must take care to avoid accumulation of debris, boxes, crates, etc., resulting from the installation of the work. Contractor must remove from the premises each day all debris, boxes, etc., and keep the premises clean, subject to the Commissioner's instructions, which must be promptly carried out.
- B. Contractor must clean up all luminaires and equipment at the completion of the project.
- C. All electrical equipment including panelboards, wireways, cabinets, enclosures, etc. must be thoroughly vacuumed clean prior to energizing equipment and at the completion of the project. Equipment must be opened for observation by the Commissioner as required.

3.10 EQUIPMENT PADS AND MOUNTING

- A. Provide concrete pads for all floor mounted equipment.
- B. Contractor must provide fully dimensioned pad layouts. Shop Drawings must be used for dimensional guidance in sizing pads, anchor bolts, locations, etc.
- C. Pads must be provided for floor-mounted equipment, equipment mounted on legs and/or support stands and they must conform to the shape of the piece of equipment it serves with a minimum 3 in. margin around the equipment and supports. Pads must be a minimum of 4 in. high and made of a minimum 28-day, 3000 psi concrete reinforced with 6"x6", 6/6 gauge welded wire mesh. Top and sides of the pad must be troweled to smooth finishes, equal to those of the floors, with all corners bullnosed to 3 / 4" radius.
- D. Pads must be dowelled into slab with #4 bars at each corner embedded 3" and grouted with non-shrink grout.
- E. Furnish and install galvanized anchor bolts for all equipment placed on concrete equipment pads, inertia blocks, or on concrete slabs. Bolts must be the size and number recommended by the Manufacturer of the equipment and as required for seismic restraint. Anchor bolts must be anchored to the structural floor slab and must be located by means of suitable templates. When equipment is placed on vibration isolators, the equipment must be secured to the isolator and the isolator secured to the floor, pad, or supported as recommended by the vibration isolation manufacturer.
- F. Equipment pads for floor standing electrical equipment must have level mounting channels embedded in the concrete as specified in the applicable sections. Where equipment is mounted on gypsum board partitions, the mounting screws must pass through the gypsum board and be securely attached to the partition studs or framework.

3.11 EQUIPMENT NOISE AND VIBRATION

- A. Equipment and systems, as defined herein, must be quiet and free of apparent vibration while in operation.
- B. Vibration must not be apparent to the senses in occupied areas of the building. Both the balancing of rotating machinery and the installation of vibration isolators are required.



- C. Any additional precautions deemed necessary to provide a quiet installation must be done as part of the Work of this Section, subject to review by the Commissioner and without additional cost to the City of New York. After the systems are in operation, it must be the responsibility of the Contractor to make any changes to equipment or Work

3.12 FINAL ACCEPTANCE TESTS

- A. The entire electrical installation must be pre-tested, inspected, thoroughly cleaned, and damaged finishes touched up after final completion prior to final acceptance testing being performed. Not less than 30 days prior to the final acceptance testing, furnish the pre-test results and a test plan, to the Commissioner for review, outlining all aspects of the testing, including tests to be performed and the expected results.
- B. Provide complete documentation of all component and system tests prior to Commissioner acceptance and turnover of components or systems. In addition, the Commissioner reserves the right to review all test objectives, test plans and test cases, and witness all preoperational tests. Provide the Commissioner with a comprehensive schedule detailing the preparation of testing documentation and the conduct of all component or system tests.
- C. Perform the following field test in the presence of the Commissioner to demonstrate the reliability of the electrical installation. Give the Commissioner a minimum of one week advance notice of such tests.
- D. Operate all electrical systems and equipment for a period of 24 hours, unless in the opinion of the Commissioner, a different test period is required, to prove the operation and performance of a system and its equipment.
- E. Should the foregoing test reveal any defects, promptly correct such defects and re-run the tests until the entire installation conforms to the requirements of these Specifications and the Drawings.
- F. Tests requiring certified reports and those requiring factory or field inspection must be conducted and reported to the Commissioner.
- G. In addition to the tests outlined above, after completion of the electrical system and prior to occupancy, the following equipment and devices, as a minimum, must be thermographically inspected.
 - 1. Feeder splices and Connections.
 - 2. Panelboards.
 - 3. All 208 volt (nominal) cable connections rated 100 amperes (#3 AWG) or greater.
 - 4. Other equipment as shown on the Drawings
- H. The inspection must be made by an independent inspection company. The inspection must be made with all equipment, motors, lighting fixtures, and miscellaneous loads operating and with all equipment covers removed.
 - I. Inspection reports complete with color photographs of the infrared scan and control photographs indicating the ambient temperature and any hot spots of each item inspected must be submitted to the Commissioner for approval. Any equipment, connections or devices indicated to be operating improperly performing equipment must be replaced or



repaired by the Contractor at no cost to the City of New York.

3.13 DEMONSTRATE AND OPERATION INSTRUCTIONS

- A. After completion of all testing, and prior to placing equipment or systems in operation, demonstrate the features and operation of the equipment or systems to the Commissioner, operational and maintenance personnel so that they are familiarized with the equipment and systems, in particularly the following equipment and systems:
 - 1. Panelboards.
 - 2. Revenue metering System
 - 3. Fire alarm and smoke detection systems.
 - 4. Other equipment and control systems shown on the Drawings.
- B. Provide the necessary accessories, test equipment, and personnel, for each demonstration.
- C. Complete all arrangements for the demonstrations through the Commissioner.
- D. Upon the completion of each demonstration or instructional session, obtain "sign-off" from the Commissioner. The "sign-off" must state that the demonstration or instructions for use were provided, that they were complete and were given to the designated personnel.
- E. The Contractor must provide the services of a factory trained specialist to supervise the testing, startup, and operation of all equipment specified herein and to instruct the Commissioner 's operators during an operating instruction period at or near the Project site. The operating instruction period must be defined as straight time working hours and must not include nights, weekends, or travel time to and/or from the Project.
- F. The Commissioner must be notified in writing at least two (2) weeks before each operating instruction period begins. The Contractor must commence no instruction period until the Commissioner has issued his written acceptance of the starting time.

3.14 OPERATION AND MAINTENANCE MANUALS

- A. The Contractor must provide operating instructions and maintenance data books for all equipment and materials furnished under this Section.
- B. Operation and Maintenance manuals must include complete cleaning, and servicing data compiled in clearly and easily understandable form. Data must show serial numbers and model numbers of each piece or equipment, complete lists of replacement parts (including part numbers), motor ratings, and actual loads.
- C. Include the following information where applicable:
 - 1. Identifying name and mark number.
 - 2. Locations of major equipment (where several similar items are used, provide a list).
 - 3. Complete nameplate data.
 - 4. "Reviewed" submittals as returned to this Contractor.
 - 5. Parts lists.
 - 6. Performance curves and data.
 - 7. Wiring diagrams.



8. Lubrication charts.
9. Manufacturers' recommended operation and maintenance instructions with all non-applicable information deleted.
10. List of spare parts recommended for normal service requirements.
11. Assembly and disassembly instructions with exploded view Drawings where available.
12. Trouble shooting diagnostic instructions where available.

END OF SECTION 26 0500



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. This Section includes building wires and cables and associated splices, connectors, and terminations for wiring systems rated 600 volts and less.

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 National Electrical Code – 2008 with NYC Amendments.

1.6 WARRANTY

- A. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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 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:
 - 3.
 - 4. AFC Cable Systems, Inc.
 - 5. AMP Incorporated/Tyco International.
 - 6. Hubbell/Anderson.
 - 7. O-Z/Gedney; EGS Electrical Group LLC.
 - 8. 3M Company; Electrical Products Division.
 - 9. 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 "Raceways and Boxes". 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 284600 "Fire Detection and 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. Seal around cables penetrating fire-rated elements according to Section 078400 "Firestopping".
- F. Identify wires and cables according to Section 260553 "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. In particular, note the following circuitry requirements for low voltage systems:
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 National Electrical Code - 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 as described in other sub-section of this Section.

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. This 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 Power Conductors and Cables”
 - 2. Section 26 05 33 – “Raceways and Boxes for Electrical Systems”

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 013300 “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, as amended by state and local codes New York City Electrical Code.

1.6 WARRANTY

- A. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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. 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 National Electrical Code NEC - 2008 Amended by New York City, 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 Code 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 Code.
- 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 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 Code.
- 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 insure 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
2000	*6 X 250 KCMIL
* 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, as amended by state and local codes New York City Electrical Code 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 be 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. 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.
- B. 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 National Electrical Code -2008 Amended by the City of New York.

1.6 PERFORMANCE REQUIREMENTS

- A. Engineering Services: Design supports for multiple raceways, including comprehensive engineering analysis by professional engineer licensed in the State of New York, using performance requirements and design criteria indicated.
- B. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- C. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

- D. 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.

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 APPLICATION

- 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 by NECA 1, where its Table 1 lists maximum spacings less than stated in NFPA 70. 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.
- 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 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 Division 09 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



THIS PAGE INTENTIONALLY LEFT BLANK



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. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.
- B. Related Sections
 - 1. Section 26 05 29 “Hangers and Supports for Electrical Systems”.
 - 2. Section 26 05 33.16 “Boxes for Electrical Systems”.

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 013300 “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 70-2008, as amended by City of New York.

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 WARRANTY

A. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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 METAL CONDUIT AND TUBING

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Alfalex 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 products 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, Type 1.
 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.
- 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. Arcco 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.
- 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.
- 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 alternate 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. Refer to appropriate Sections of Division 26 for 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. 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. Install temporary closures to prevent foreign matter from entering raceway.
- D. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portion of bends is not visible above the finished slab.
- E. 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.
- F. 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.
- G. 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.
- H. Join raceways with fittings designed and approved for the purpose and make joints tight.
 - 1. Use insulating bushings to protect conductors.
- I. Tighten set screws of threadless fittings with suitable tool.
- J. Equip all raceways which cross building expansion or control joints, with expansion fittings having flexible grounding bonds bypassing sliding parts.
- K. 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.
- L. 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.



- M. 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.
- N. 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 NFPA70.
- O. 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.
- P. 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.
- Q. 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:
 - 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.
- B. Clock outlet -- As required for clock to clear underside of ceiling by 1 inch (25 mm).



- C. 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 0533.16 - 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:
 - 1. Wall and ceiling outlet boxes.
 - 2. Floor boxes.
 - 3. Pull and junction boxes.
- B. Related Sections:
 - 1. Section 07 84 00 – “Firestopping”
 - 2. Section 08 31 13 – “Access Doors and Frames”
 - 3. Section 26 27 26 – “Wiring Devices”

1.3 SUBMITTALS PROCEDURES

- A. Refer to DDC General Conditions Section 013300 “Submittal Procedures”.

1.4 SUBMITTALS

- A. Refer and comply with Section 26 0500 “Common Work Results for Electrical”.
- B. List of box construction, size and finish indicating where each type will be used.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.
- B. Conform to requirements of ANSI/NFPA 70-2008.
- C. Furnish products listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

1.6 PROJECT CONDITIONS

- A. Verify locations of floor boxes and outlets prior to rough-in.
- B. Electrical boxes are shown on Drawings in approximate locations unless dimensioned. Refer to architectural plans for dimensional requirements.

1.7 REFERENCES

- A. ANSI/NEMA FB 1 - Fittings and Supports for Conduit and Cable Assemblies.



- B. ANSI/NEMA OS 1 - Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- C. ANSI/NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.
- D. ANSI/NFPA 70 - National Electrical Code-2008.
- E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

1.8 WARRANTY

- A. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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 OUTLET BOXES

- A. Hazardous Location Fittings and Outlet Boxes:
 - 1. Conform to UL Std. 886 and NYCEC
 - 2. Fittings must be malleable iron construction
 - 3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. OZ/Gedney
 - b. Appleton
 - c. Cooper Crouse-Hinds
 - d. Or Approved Equal
- B. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1, galvanized steel. Minimum size 4 inches square for power, 4 11/16" x 4 11/16" x 2 1/8" deep for telephone and data, unless otherwise noted.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Steel City
 - b. Racor
 - c. Bowers
 - d. Or approved equal.
 - 2. Luminaire and equipment supporting boxes: Rated for weight of equipment supported; include 1/2-inch male fixture studs where required.
 - 3. Concrete ceiling boxes: Concrete type, 4 inch octagonal.
- C. Nonmetallic Outlet Boxes: ANSI/NEMA OS 2.
- D. Cast Boxes: NEMA FB 1, Type FD, cast ferrous alloy. Provide gasketed cover by box manufacturer. Provide threaded hubs. Manufacturers: Leviton, Appleton, Crouse-Hinds or approved equal.



2.2 FLOOR BOXES

- A. Floor Boxes: ANSI/NEMA OS 1, fully adjustable before and after concrete pour, cast metal body, complete with all necessary fittings.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. FSR
 - b. Wiremolld
 - c. Hubbell
 - d. Or approved equal.
- B. For Pullbox or Flush Outlets:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Steel City 600 series.
 - b. Walker 889 series.
 - c. Hubbell B2537.
 - d. Or approved equal.
- C. Conform to regulatory requirements for concrete-tight floor boxes.

2.3 PULL AND JUNCTION BOXES

- A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.
- B. Surface-Mounted Cast Metal Box: NEMA 250, Type 4; flat-flanged, surface-mounted junction box.
 - 1. Material: Cast aluminum.
 - 2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.
- C. In-Ground Cast Metal Box for Pedestrian or Light Vehicular Traffic Areas: NEMA 250, Type 6, flanged, recessed cover box for flush mounting.
 - 1. Material: Galvanized cast iron.
 - 2. Cover: Nonskid cover with neoprene gasket and stainless steel cover screws.
 - 3. Cover legend: Electric or as noted.
- D. Manufacturers: Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Crouse-Hinds
 - 2. Appleton
 - 3. E-Abel
 - 4. Or approved equal.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.



3.2 INSTALLATION

- A. Install electrical boxes as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
- B. Install electrical boxes to maintain headroom and to present neat mechanical appearance.
- C. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- D. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- E. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods under the provisions of Section 078400 “Firestopping”.
- F. Align adjacent wall-mounted outlet boxes for switches, thermostats, and similar devices with each other.
- G. Use flush mounting outlet boxes in finished areas.
- H. Do not install flush mounting boxes back-to-back in walls; provide minimum 6 inch separation. Provide minimum 24 inches separation in acoustic rated and fire rated walls.
- I. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
- J. Use stamped steel bridges to fasten flush mounting outlet box between studs.
- K. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- L. Use adjustable steel channel fasteners for hung ceiling outlet box.
- M. Do not fasten boxes to ceiling support wires.
- N. Support boxes independently of conduit, except cast box that is connected to two rigid metal conduits both supported within 12 inches of box.
- O. Use gang box where more than one device is mounted together. Do not use sectional box.
- P. Use gang box with plaster ring for single device outlets.
- Q. Use cast outlet box with gasketed cover plate in exterior locations and wet locations (including under the soffits and canopies).
- R. Use cast floor boxes for installations in slab on grade; formed steel boxes are acceptable for other installations.
- S. Set floor boxes level to top of slab.
- T. When casting floor boxes in slab each floor box must be provided with a drag wire to pull cables and provided with protective cover to prevent concrete from entering the floor box prior to concrete pour.



- U. Large Pull Boxes: Boxes larger than 100 cubic inches in volume or 12 inches in any dimension.
 - 1. Interior Dry Locations: Use hinged enclosure.
 - 2. Other Locations: Use surface-mounted cast metal box.

3.3 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate locations and sizes of required access doors with Section 08 3113 “Access Door and Frames”.
- B. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- C. Coordinate mounting heights and locations of outlets mounted above counters, benches and backsplashes.
- D. Position outlet boxes to locate luminaires as shown on reflected ceiling plan.

3.4 ADJUSTING

- A. Adjust floor box flush with finish flooring material.
- B. Adjust flush-mounting outlets to make front flush with finished wall material.
- C. Install knockout closure in unused box openings.

END OF SECTION 26 0533.16



THIS PAGE INTENTIONALLY LEFT BLANK

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. This Section includes electrical identification materials and devices required to comply with ANSI C2, NFPA 70-2008, NYC Electrical Code, 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 NYC Electrical Code.
- C. Comply with ANSI A13.1 and NFPA 70 for color-coding.
- D. Comply with ANSI Z535-4 and NFPA 70E.

1.6 WARRANTY

- A. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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 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 ((0.08 mm thick by 25 to 51 mm 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- ((0.4-mm-)) hick 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 ((0.05 mm)) 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 ((51 by 51 by 1.3-mm)) 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 ((1.6 mm)) thick for signs up to 20 sq. in. ((129 sq. cm)) and 1/8 inch ((3.2 mm)) 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 ((6.4-mm)) grommets in corners for mounting.
- D. Exterior, Metal-Backed, Butyrate Signs: Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch ((1-mm)) galvanized-steel backing; and with colors, legend, and size required for the application. 1/4-inch ((6.4-mm)) 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 ((5 mm)).
 - 2. Tensile Strength: 50 lb ((22.3 kg)) minimum.
 - 3. Temperature Range: Minus 40 to plus 185 deg F ((Minus 40 to plus 85 deg C)).
 - 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 ((51 mm)) wide, completely encircling conduit.
 - 2. Band Locations: At changes in direction, at penetrations of walls and floors, at 50-foot ((15-m)) maximum intervals in straight runs, and at 25-foot ((7.6-m)) 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 (150 mm) 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-(25-mm-) 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 (76 mm) from the terminal and spaced 3 inches (76 mm) apart. Apply with a special tool or pliers, tighten to a snug fit, and cut off excess length.

- I. 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.
- J. 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.
- K. Equipment Identification Labels: Engraved plastic laminate. Install on 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- (13-mm-) high lettering on 1-1/2-inch- (38-mm-) high label; where two lines of text are required, use labels 2 inches (50 mm) 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. Disconnect switches.
 - 5. Motor starters.
 - 6. Contactors
 - 7. Dimmers.
 - 8. Control devices.
 - 9. Fire alarm master station or control panel.
 - 10. Device wall plates
 - 11. Lighting Control Panels
 - 12. Fire Alarm Pull Boxes
 - 13. Fire Alarm Remote Smoke Detectors
 - 14. All other Fire Alarm Devices
 - 15. Lamps
 - 16. Luminaires

END OF SECTION 26 05 53

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 26 08 00

COMMISSIONING OF 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. This section includes commissioning process requirements for Electrical systems, assemblies, and equipment.
- B. Related Sections:
 - 1. DDC General Conditions Section 019113 "General Commissioning Requirements for MEP Systems" for general commissioning process requirements.

1.3 DESCRIPTION

- A. Commissioning is a systematic process of confirming that all building systems perform interactively according to the Owner's Project Requirements and the Basis of Design and continuing through construction, acceptance and the warranty period with actual verification of performance.
- B. The Commissioning process does not take away from or reduce the responsibility of the Contractor to provide a finished and fully functioning product.
- C. The CxA directs and coordinates the commissioning activities and reports to the Commissioner. All members in the construction process work together to fulfill their contracted responsibilities and meet the objectives of the Owner's Project Requirement's as detailed in the Contract Documents.

1.4 DEFINITIONS

- A. Refer to the DDC General Conditions for definitions.

1.5 SUBMITTALS

- A. The CxA will review and approve submittals related to the commissioned equipment for conformance to the Contract Documents as it relates to the commissioning process, to the functional performance of the equipment and adequacy for developing test procedures. This review is intended primarily to aid in the development of functional testing procedures and only

secondarily to verify compliance with equipment specifications. The CxA will notify the Contractor, or Commissioner as requested, of items missing or areas that are not in conformance with Contract Documents and which require resubmission.

- B. The CxA will receive a copy of the final approved submittals.
- C. In addition, the Contractor is to provide the following:
 - 1. Certificates of readiness
 - 2. Certificates of completion of installation, prestart, and startup activities.
 - 3. O&M manuals
 - 4. Test reports
- D. Refer to the DDC General Conditions Section 013300 "Submittal Procedures" and Section 019113 "General Commissioning Requirements for MEP Systems" for general commissioning submittal requirements.

1.6 QUALITY ASSURANCE

- A. Test Equipment Calibration Requirements: Contractor will comply with test manufacturer's calibration procedures and intervals. Recalibrate test instruments immediately after instruments have been repaired resulting from being dropped or damaged. Affix calibration tags to test instruments. Furnish calibration records to CxA upon request.

1.7 COORDINATION

- A. 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.
- B. 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.
- C. 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.
- D. Pre-testing Meetings: The Contractor will attend pretest meetings with the Commissioning Team, chaired by the CxA, to review startup reports, pre-test 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.

- E. Testing: The Contractor will coordinate with testing personnel and agencies for timing and access for CxA to witness test.
- F. Manufacturers' Inspection and Startup Services: The Contractor will coordinate services of manufacturers' inspection and startup services.
- G. Testing, Adjusting and Balancing: The Contractor will coordinate with plan and schedule for testing, adjusting and balancing for timing and access for CxA to witness process.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

- A. All standard testing equipment required to perform startup, initial checkout and functional performance testing shall be provided by the Contractor for the equipment being tested. For example, the Contractor shall ultimately be responsible for all standard testing equipment for the electrical systems and controls systems in Division 26. A sufficient quantity of two-way radios shall be provided by the Contractor.
- B. Proprietary test equipment and software required by any equipment manufacturer for programming and/or start-up, whether specified or not, shall be provided by the manufacturer of the equipment. Manufacturer shall provide the test equipment, demonstrate its use, and assist in the commissioning process as needed. Proprietary test equipment (and software) shall become the property of the City of New York upon completion of the commissioning process.
- C. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the Specifications. If not otherwise noted, the following minimum requirements apply: Temperature sensors and digital thermometers shall have a certified calibration within the past year to accuracy of 0.5°F and a resolution of + or - 0.1°F. Pressure sensors shall have an accuracy of + or - 2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year.

PART 3 - EXECUTION

3.1 GENERAL DOCUMENTATION REQUIREMENTS

- A. With assistance from the Contractor and the CxA will prepare Pre-Functional Checklists for all commissioned components, equipment, and systems.
- B. Red-lined Drawings (As-Builts): The Contractor will verify all equipment, systems, instrumentation, wiring and components are shown correctly on red-lined drawings. Preliminary red-lined drawings must be made available to the Commissioning Team for use prior to the start



of Functional Performance Testing. Changes, as a result of Functional Testing, must be incorporated into the final as-built drawings, which will be created from the red-lined drawings. The Contractor will create the as-built drawings.

- C. Operation and Maintenance Data: Contractor will provide a copy of O&M literature within 45 days of each submittal acceptance for use during the commissioning process for all commissioned equipment and systems. The CxA will review the O&M literature once for conformance to project requirements. The CxA will receive a copy of the final approved O&M literature once corrections have been made by the Contractor.
- D. Demonstration and Orientation: Contractor will provide demonstration and orientation as required by the specifications. A complete orientation plan and schedule must be submitted by the Contractor to the CxA four weeks (4) prior to any orientation. An orientation agenda for each orientation session must be submitted to the CxA one (1) week prior the orientation session.

3.2 CONTRACTOR'S RESPONSIBILITIES

- A. Refer to the DDC General Conditions Section 019113 "General Commissioning Requirements for MEP Systems" for Contractor's responsibilities.
- B. Attend construction phase controls coordination meetings.
- C. Provide information requested by the CxA for final commissioning documentation.
- D. Prepare preliminary schedule for electrical system orientations and inspections, operation and maintenance manual submissions, orientation sessions, equipment start-up and task completion for the City of New York. Distribute preliminary schedule to commissioning team members.
- E. 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.
- F. Provide detailed startup procedures.
- G. 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.
- H. Provide a written schedule frequency to review the various set-points and reset schedules to ensure they are current relevant and efficient values.
- I. Respond to provided new deficiencies and/or responses within five (5) business days.
- J. 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.
- K. Coordinate with the CxA to provide 48-hour advance notice so that the witnessing of equipment and system start-up and testing can begin.
- L. 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.



- M. 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.
 - 1. Electrical equipment including main distribution panel, panel boards, and lighting controls and all other equipment furnished under Division 26.
- N. The equipment suppliers shall document the performance of their equipment.
- O. Provide a complete set of red-lined drawings to the CxA prior to the start of Functional Performance Testing.
- P. Contractor responsibilities to be completed by Equipment Suppliers:
 - 1. 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.
 - 2. Assist in equipment testing.
 - 3. Provide information requested by CxA regarding equipment sequence of operation and testing procedures.

3.3 CxA'S RESPONSIBILITIES

- A. Roles and Responsibilities
 - 1. Refer to the DDC General Conditions Section 019113 "General Commissioning Requirements for MEP Systems" for general CxA responsibilities.

3.4 TESTING PREPARATION

- A. Certify in writing to the CxA that Electrical systems, subsystems, and equipment have been installed, calibrated, and started and are operating according to the Contract Documents.
- B. Certify in writing to the CxA that Electrical instrumentation and control systems have been completed and calibrated, that they are operating according to the Contract Documents, and that pretest set points have been recorded.
- C. Certify in writing that testing procedures have been completed and that testing reports have been submitted, discrepancies corrected, and corrective work approved.
- D. Place systems, subsystems, and equipment into operating mode to be tested (e.g., normal shutdown, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).
- E. Inspect and verify the position of each device and interlock identified on checklists.
- F. Check safety cutouts, alarms, and interlocks with smoke control and life-safety systems during each mode of operation.
- G. Testing Instrumentation: Install measuring instruments and logging devices to record test data as directed by the CxA.

3.5 GENERAL TESTING REQUIREMENTS

- A. Provide technicians, instrumentation, and tools to perform commissioning test at the direction of the CxA.
- B. Scope of Electrical testing shall include the entire Electrical installation, from the incoming power equipment throughout the distribution system. Testing shall include measuring, but not be limited to resistance, voltage, and amperage of system(s) and devices.
- C. Test all operating modes, interlocks, control responses, and responses to abnormal or emergency conditions, and verify proper response of building automation system controllers and sensors.
- D. The CxA along with the Contractor shall prepare detailed testing plans, procedures, and checklists for Electrical systems, subsystems, and equipment. The Contractor shall ensure the participation of the electrical subcontractor.
- E. Tests will be performed using design conditions whenever possible.
- F. 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.
- G. The CxA may direct that set points be altered when simulating conditions is not practical.
- H. 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.
- I. If tests cannot be completed because of a deficiency outside the scope of the Electrical system, document the deficiency and report it to the Commissioner. After deficiencies are resolved, reschedule tests.
- J. If the testing plan indicates specific seasonal testing, complete appropriate initial performance tests and documentation and schedule seasonal tests.

3.6 ELECTRICAL SYSTEMS, SUBSYSTEMS, AND EQUIPMENT TESTING PROCEDURES

- A. Equipment Testing and Acceptance Procedures: Testing requirements are specified in individual Division 26 sections. Provide submittals, test data, inspector record, infrared camera and certifications to the CxA.
- B. Electrical Instrumentation and Control System Testing: Field testing plans and testing requirements are specified in Division 23 Section 230993 "Sequence of Operations for HVAC Controls". Assist the CxA with preparation of testing plans.
- C. Electrical Distribution System Testing: Provide technicians, load banks, infrared cameras, instrumentation, tools and equipment to test performance of designated systems and devices at the direction of the CxA. The CxA shall determine the sequence of testing and testing procedures for each equipment item and pipe section to be tested



- D. Vibration and Sound Tests: Provide technicians, instrumentation, tools, and equipment to test performance of vibration isolation and seismic controls.
- E. The work included in the commissioning process involves a complete and thorough evaluation of the operation and performance of all components, systems and sub-systems. Commissioning shall be performed on equipment and systems including but not limited to the following:
 - 1. Main Distribution Panel
 - 2. Power Panels
 - 3. Grounding System
 - 4. Lighting Controls

3.7 DEFICIENCIES/NON-CONFORMANCE, FAILURE DUE TO MANUFACTURER DEFECT

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 shall be noted and reported to the Commissioner and Contractor on a standardized form.
- 2. The Contractor shall respond to new deficiencies within five (5) business days. The response shall indicate the proposed means of correcting the issue and the anticipated date of correction. If further information is required to clarify the issue, the Contractor's response shall include a request such clarification. If the Contractor understands that the issue has been resolved or was noted in error, the Contractor's response shall provide an explanation of their reasoning, including reference to Contract Documents as necessary.
- 3. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CxA.
- 4. Every effort will 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 the issue does not require further clarification for the Contractor to resolve, the CxA documents the deficiency and the Contractor's response and corrections or plans for correction. The CxA and the Contractor then proceed to another test or sequence. Once the Contractor corrects the deficiency, the test is rescheduled and repeated to demonstrate correct operation or function.
- 7. When additional information is required about any deficiency, whether to clarify the issue or to clarify the means of resolution or acceptance, the CxA documents the deficiency and the Contractor's response. The CxA will send the deficiency to the Commissioner and the Contractor, who shall forward to any subcontractors required for the correction. Once all parties are in agreement as to the means of resolving the issue, the CxA will document the agreed-upon resolution process. The CxA will document the correction or resolution. If the correction requires work by the Contractor, the Contractor and CxA will reschedule the test to demonstrate correct operation and function.

B. Failure due to Manufacturer Defect

- 1. If 10% or three, whichever is greater, of identical pieces (size alone does not constitute a difference) of equipment fail to perform to the Contract Documents (mechanically or



substantively) due to manufacturing defect, not allowing it to meet its submitted performance spec, all identical units may be considered unacceptable by the CxA and the Commissioner. In such case, the Contractor shall provide the Commissioner with the following.

- a. Within one week of notification from the Contractor the manufacturer's representative shall examine all other identical units making a record of the findings. The findings shall be provided to the Commissioner within two weeks of the original notice.
- b. Within two weeks of the original notification, the Contractor or manufacturer shall 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 shall not significantly exceed the specification requirements of the original installation.
- c. The 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 shall replace or repair all identical items, at their expense and extend the warranty accordingly, if the original equipment warranty had begun. The replacement/repair work shall proceed with reasonable speed beginning within one week from when parts can be obtained.

3.8 APPROVAL

- A. The CxA notes each satisfactorily demonstrated function on the test form. Formal approval of the functional test is made later after review by the CxA. The CxA recommends acceptance of each test to the Commissioner using a standard form.

3.9 SEASONAL TESTING

- A. Seasonal Testing – During the warranty period, seasonal testing (tests delayed until weather conditions are closer to the system's design) shall be completed as part of this contract. The CxA shall coordinate this activity. Tests will be executed, documented and deficiencies corrected by the Contractor, with facilities staff and the CxA witnessing. Any final adjustments to the O&M manuals and record documents due to seasonal testing will be made by the Contractor.

3.10 OPERATION AND MAINTENANCE MANUALS

- A. The Operation and Maintenance Manuals shall conform to Contract Documents requirements as stated in the DDC General Conditions Section 017839 "Contract Record Documents and Section" 019113 "General Commissioning Requirements for MEP Systems."
- B. The specific content and format requirements for the standard O&M manuals are detailed in the DDC General Conditions Section 017839 "Contract Record Documents" and Section 019113 "General Commissioning Requirements for MEP Systems." Special requirements for the controls subcontractor and TAB subcontractor are found in Division 23.
- C. CxA Review and Approval – Prior to substantial completion, the CxA shall review the O&M manuals, documentation and record documents for systems that were commissioned to verify compliance with the Specifications. 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 O&M manuals to the Commissioner. The CxA also reviews each equipment warranty and verifies that all requirements to keep the warranty valid are clearly stated.

3.11 INSTRUCTION OF NEW YORK CITY PERSONNEL

- A. The Contractor shall be responsible for instruction coordination, scheduling, and ultimately for ensuring that instruction is completed.
- B. The CxA shall oversee the instruction of the City of New York's personnel for commissioned equipment and systems.
 1. The CxA shall 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 shall decide how rigorous the instruction should be for each piece of commissioned equipment. The CxA shall communicate the results to the Contractor who will ensure participation of the subcontractor.
 2. In addition to these general requirements, the specific instruction requirements of the City of New York's personnel by the Contractor who will ensure the subcontractors and vendors are specified in the individual sections listed in DDC's General Conditions Section 017900 "Demonstration and Owners' Pre-Acceptance Orientation."
 3. The Contractor shall 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. For the primary equipment, the Contractor will ensure the controls subcontractor provides a discussion of the control of the equipment during the instruction conducted by each subcontractor or vendor.
 6. Instruction documentation shall include the following items:
 - a. Copy of the instruction plan, including schedule, syllabus, and agenda.
 - b. Copy of the Owner's Project Requirements.



- c. Copy of the Basis of Design.
 - d. Compiled operations manuals.
 - e. Compiled maintenance manuals.
 - f. Completed manufacturer instruction manuals.
 - g. Red-lined drawings.
7. 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.
8. At one of the instruction sessions, the CxA presents a presentation discussing the use of the blank functional test forms for re-commissioning equipment
9. Video recording of the instruction sessions will be verified by the CxA in electrical format, at the discretion of the Commissioner.

END OF SECTION 260800



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".
- 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 013300 "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 from 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. Approved equal

2.2 SYSTEM COMPLIANCE

- B. System components must comply with UL 916 and UL 924 standards where applicable.
- C. System components must comply with CFR Title 47, Part 15 standards where applicable.
- D. System components must comply with ISED Canada RSS-247 standards where applicable.
- E. All equipment must be installed and connected in compliance with NFPA 70.

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 and provide cost savings, the use of mixed types of low voltage network cables must not be 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 must not be 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, but not be limited to, 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, but not limited to, 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 but not be limited to, 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, but not be limited to, 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, but not limited to, Microsoft Internet Explorer, Apple Safari, Google Chrome, Mozilla Firefox.
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, but not be limited to, 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 LEDcode 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) must not be acceptable.

5. All sensing technologies must be acoustically passive, meaning they do not transmit sound 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 louver/damper motor control for skylights.
 - i. Secondary Pack capable of providing a pulse on/pulse off signal for purposes of controlling shade systems via relay inputs.
 - j. 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).
 - k. 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 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:
 - Titleblock
 - Text- Inclusive of room names and numbers, fixture tags and drawings notes
 - Fixture wiring and homeruns
 - Control devices
 - Hatching or poché of light fixtures or architectural elements
 - 2) Coordinate CAD files version with 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. Changes to this file will not be made by the factory.
 2. Grant access to the Commissioner for the programming database, if requested.
- B. City of New York Instruction
 1. Provisions for onsite instruction for the City of New York's designated attendees to 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. Section includes:
 - 1. Lighting and appliance branch circuit panelboards.
 - 2. Power and distribution panelboards.

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 to include in maintenance manuals specified in DDC General Conditions. In addition to requirements specified in DDC General Conditions Section "Operation and Maintenance Data," 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 Requirements".
- 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 70-2008, Article 100, by Underwriters Laboratories Inc.
- D. Comply with NEMA PB 1.
- E. Comply with New York City Electrical Code-2011.

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. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Panelboards and Accessories:
 - a. Siemens Energy & Automation, Inc.
 - b. General Electric Co.; Electrical Distribution & Control Div.
 - c. Eaton Corp.; Cutler-Hammer Products.
 - d. Square D Co.
 - e. 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 specified in Section 26 2813 "Fuses".

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 2813 "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 devices. U.L. labels must include size and type of allowable upstream and branch circuit devices and series connected ratings.
 - 1. 120/208 volt power or distribution panels must be fully rated for not less than 22,000 amps.
 - 2. 120/208 volt lighting or appliance panels must be "fully rated" for 10,000 amps except that panels supplied from transformers 225 KVA and larger must be "fully rated" or "series connected" rated for not less than 22,000 amps.
- B. Panelboard short circuit ratings must comply with the following:
 - 1. Distribution and power panels must be "fully rated" for 200,000 amps when used in conjunction with appropriate current limiting fuses as specified.
 - 2. Distribution and power panels must be "fully rated" for not less than 150,000 100,000 65,000 42,000 22,000 amps.

3. Lighting and appliance panels must be series rated for not less than 150,000 100,000 65,000 42,000 22,000 amps when used in conjunction with appropriate main or upstream current limiting or high interrupting capacity circuit breakers.

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.
- E. Set field-adjustable switches and circuit-breaker trip ranges.
- F. Install filler plates in unused spaces.
- G. 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.
- H. 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 0533 "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 26 0526 "Grounding and Bonding for Electrical Systems".
- B. Connect wiring according to Section 26 0519 "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 262416

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 26 27 13 - ELECTRICITY 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. This Section includes provisions for the accommodation of utility company metering equipment.
- B. Related Sections
 - 1. Section 26 05 19 "Low Voltage Electrical Power Conductor and Cables."
 - 2. Section 26 05 33 "Raceways and Boxes for Electrical Systems."

1.3 SUBMITTAL PROCEDURES

- A. Refer to 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 of utility company metering provisions with indication of approval by utility company.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Listing and Labeling: Provide components that are Underwriters Laboratories listed and labeled.
 - 1. The terms "listed" and "labeled": As defined in the National Electrical Code, Article 100.
- C. Electrical Component Standard: Components and installation must comply with "2011 NYC Electrical Code", NFPA 70-2008.

1.6 GENERAL REQUIREMENTS

- A. All electricity delivered to the project will be utility company metered through various metering installations as follows:



1. Electricity consumed in the interest of the City of New York will be measured through a separate "house" metering installation located in the building electric room.
- B. Provide meter pan and/or backboards and current transformers cabinet and switchboard compartments as applicable for "house" metering within the building electric room.
- C. Provide "house" meter totalizing impulse wiring systems.
- D. Install current transformers furnished by the utility company.
- E. Meters will be furnished and installed by the utility company.
- F. All work for the metering installation must be provided in accordance with the utility company Con Edison's blue book "A Customer Guide to Electrical Service Installation".

1.7 WARRANTY

- A. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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 GENERAL

- A. Provide in accordance with the requirements of Con Edison.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

END OF SECTION 26 27 13

SECTION 26 27 26 -WIRING DEVICES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- 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.

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 specified under regulatory requirements.
 - 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”.
- B. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years documented experience.

1.6 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.

1.7 WARRANTY

- A. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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 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. Manufacturers:
1. Single-pole switch: Subject to compliance with requirements, provide Lutron Nova-T NT-1PS-SN or comparable product by one of the following:
 - a. Leviton
 - b. Lutron
 - c. Hubbel.
 - d. Or approved equal.
 2. Double-pole switch: Subject to compliance with requirements, provide Lutron Nova-T multi gang or comparable product by one of the following:
 - a. Leviton
 - b. Lutron
 - c. Hubbell.
 - d. Or approved equal.
 3. Three-way switch: Subject to compliance with requirements, provide Lutron Nova-T model NT-3PS-SN or comparable product by one of the following:



- a. Leviton
 - b. Lutron
 - c. Hubbell.
 - d. Or approved equal.
4. Four-way switch: Subject to compliance with requirements, provide Lutron Nova-T model NT-4PS-SN or comparable product by one of the following:
- a. Leviton
 - b. Lutron
 - 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 and Model Number:
 - 1. Duplex convenience receptacle: Subject to compliance with requirements, provide Lutron Nova-T model NTR-20-ST or comparable product by one of the following:
 - a. Leviton
 - b. Lutron
 - c. Hubbell.
 - d. Or approved equal.
 - 2. GFCI receptacle: Subject to compliance with requirements, provide Lutron Nova-T model NTR-20-GFCI-ST or comparable product by one of the following:
 - a. Leviton
 - b. Lutron
 - c. Hubbell.
 - d. Or approved equal
 - 3. Special Receptacle: Subject to compliance with requirements, type as identified by NEMA standard number on drawings, provide products 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. Manufacturers: Subject to compliance with requirements, provide Lutron Nova-T or or comparable product by one of the following:
 - a. Leviton
 - b. Lutron
 - 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, products 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 others) as per Section 26 0553 "Identification for Electrical Systems".

3.5 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate locations of outlet boxes provided under Section 26 0533 "Raceways and Boxes for Electrical Systems" 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

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. This 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, Article 100 and marked for intended use.
- D. Comply with NEMA FU 1.
- E. Comply with NYC Electrical Code-2011.

1.6 PROJECT CONDITIONS

- A. Where ambient temperature to which fuses are directly exposed is less than 40 deg F (4.4 deg C)) or more than 100 deg F (38 deg C)), 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. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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. 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- (1.27-mm-) 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 (40-mm)) 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 262816.13 - 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).

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. Include evidence of NRTL listing for series rating of installed devices.
 - 4. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.
 - 5. 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.
 - 1. Wiring Diagrams: For power wiring.
- C. Qualification Data: For qualified testing agency.
- D. 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.
- E. Manufacturer's field service report.

- F. Operation and Maintenance Data: For circuit breakers to include in operation and maintenance manuals. In addition to items specified in the DDC General Conditions 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.
1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
- C. Source Limitations: Obtain circuit breakers, components, and accessories, within same product category, from single source from single manufacturer.
- D. 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.
- E. 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 (minus 30 deg C) and not exceeding 104 deg F (40 deg C).
- B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by the City of New York 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 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. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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 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 0553 "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.

3.5 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 262816.13

SECTION 26 2816.16 - ENCLOSED DISCONNECT 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. Disconnect switches.
 - 2. Fuses.
 - 3. Enclosures.

1.3 SUBMITTALS PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 SUBMITTALS

- A. Submit product data under provisions of Section 26 0500, Common Work Results for Electrical.
- B. Include outline drawings with dimensions, and equipment ratings for voltage, capacity, horsepower, and short circuit.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.6 REFERENCES

- A. ANSI/UL 198C - High-Intensity Capacity Fuses; Current Limiting Types.
- B. ANSI/UL 198E - Class R Fuses.
- C. NEMA KS 1 - Enclosed Switches.

1.7 WARRANTY

- A. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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 DISCONNECT SWITCHES**

- A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Cutler Hammer.
 - 2. General Electric.
 - 3. Square D.
 - 4. Or approved equal.
- B. Description
 - 1. Fusible Switch Assemblies: NEMA KS 1; quick make, quick break, load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse Clips: designed to accommodate Class R fuses.
 - 2. Nonfusible Switch Assemblies: NEMA KS 1; Type HD; quick make, quick break, load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position.
 - 3. Enclosures: NEMA KS 1; Type 1 unless otherwise indicated on Drawings.

2.2 FUSES

- A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Bussman
 - 2. Gould-Shawmut
 - 3. Littlefuse
 - 4. Or approved equal.
- B. Description
 - 1. Fuses 600 Amperes 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: 200,000 rms amperes.

PART 3 - EXECUTION**3.1 EXECUTION REQUIREMENTS**

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. Install disconnect switches where indicated on Drawings.
- B. Install fuses in fusible disconnect switches.

END OF SECTION 26 2816.16

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:
 - 1. Enclosed controllers rated 600 V and less.
 - 2. Full-voltage manual.
 - a. Full-voltage magnetic.
 - b. Multispeed.

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, by a qualified 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. Manufacturer shall provide warranty for a period of one year from substantial completion. Warranty shall 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 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 20tripping 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 20tripping 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. Wash-Down Areas: Type 4X, stainless steel
 - 4. Other Wet or Damp Indoor Locations: Type 4
 - 5. 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 0529 "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 Division 03 Section 03 3000 "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 2813 "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 260553 "Identification for Electrical Systems."
 - 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
 - 2. Label each enclosure with engraved nameplate.
 - 3. 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 0519 “Low Voltage Electrical Power Conductors and Cables.”
- B. Bundle, train, and support wiring in enclosures.
- C. 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 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 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.

3.7 DEMONSTRATION

- A. Instruct City of New York's maintenance to adjust, operate, and maintain enclosed controllers.

END OF SECTION 26 2913

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. This specification defines the electrical and mechanical characteristics and requirements for a stored electrical energy, uninterruptible, emergency power supply system. 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. 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. 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.

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 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 date of substantial completion.
- B. Battery warranty must be 1 year full replacement, 14 year prorated.

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 MANUFACTURERS :

- A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Controlled Power Company.
 2. Core Power and Environment



3. Power management Systems, inc.
4. 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-Programmable 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 $\pm 2\%$ 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:

<u>Rating / Voltage</u>	<u>Weight (lb.)</u>	<u>Dimensions W x D x H</u>
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 SNMP / Ethernet TCP/IP 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 lighting (switched via photocell or 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 0526 "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.
- C. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

3.5 IDENTIFICATION

- A. Identify equipment and components according to Section 26 0553 "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 3323

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 GENERAL REQUIREMENTS

- A. Work of this section shall be governed by the Contract Documents. Provide materials, labor, equipment, and services necessary to furnish, deliver, and install all work of this section as shown on the drawings, as specified herein, and/or as required by job conditions.
- B. The work shall include but not be limited to the following:
 - 1. Complete shop fabrication
 - 2. Delivery to job site
 - 3. Installation at designated locations, and controls as noted
 - 4. Lamping and lamps
 - 5. Lamp focusing
 - 6. Cleaning and protection

1.3 DESCRIPTION OF WORK

- A. Furnish and install a lighting fixture of the type indicated by letter at each location shown on the drawings.
- B. All materials, accessories, and any other equipment necessary for the complete and proper installation of all lighting fixtures included in this Contract shall be furnished by the Contractor.
- C. Conformance: Fixtures shall be manufactured in strict accordance with the Contract Drawings and Specifications.
- D. Codes: Materials and installation shall be in accordance with the latest revision of the National Electrical Code and any applicable Federal, State, and local codes and regulations.
- E. U.L. Listing: All fixtures shall be manufactured in strict accordance with the appropriate and current requirements of the Underwriters' Laboratories, Inc. "Standards for Safety," and others as they may be applicable. A UL listing shall be provided for



each fixture type, and the appropriate label or labels shall be affixed to each fixture in a position concealing it from normal view.

1.4 REFERENCE STANDARDS

- A. ANSI/NFPA 70 – National Electrical Code
- B. New York City Electrical Code
- C. New York City Building Code (and Reference Standards)
- D. Underwriters Laboratory (UL)
- E. National Electrical Manufacturers Association (NEMA)
- F. Uniform Building Code, 1988 Edition for Seismic Design Requirements
 - 1. Lighting fixtures: Section 47.1813 requires fixtures weighting less than 56 pounds to have two (2) number 12 hangers from the housing to the structure above; more than 56 pounds requires "approved" hanger pendant fixtures to be hung directly from the structure above.
- G. Aluminum Association (AA)
- H. American Iron and Steel Institute (AISI)

1.5 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Shop Drawings shall clearly indicate the contract drawing number of fixture details used as reference in the development of the shop drawings, and the names of the job, and Commissioner.
- C. The Contractor shall coordinate all his lighting fixture drawings with the drawings and details of the Architectural, Structural, Electrical, Mechanical, and other related trades to assure a perfect and efficient installation.
- D. No variation from the general arrangement and details indicated on the drawing shall be made on the shop drawings unless required to suit the actual conditions on the premises, and then only with the written approval of the Commissioner.
- E. Catalogue cuts lacking sufficient detail to indicate compliance with contract documents will not be acceptable.
- F. Timely submission: Shop drawings for all lighting fixtures shall be received no later than sixty days after award of Contract.
- G. Review of shop drawings or samples does not waive contract requirements.
- H. Photometric Data: Where indicated on the fixture schedule and contract drawings, supply complete photometric data for the fixture including optical performance rendered by independent testing laboratory, developed according to methods of U.S.A.



Illuminating Engineering Society. For down and semi-down lights used for general illumination:

1. Coefficients of utilization.
 2. Visual Comfort Probability data (fluorescent only for 100 foot-candles), rooms with reflectances of 80 percent (ceiling), 50 percent (walls), and 20 percent (floor), including a (20 ft. by 20 ft.) room with 10 ft. ceiling and luminaires lengthwise.
 3. Candlepower data, presented graphically and numerically, in 5 degree increments (5 degree, 10 degree, 15 degree, etc.). Data developed for up and down quadrants normal, parallel, and at 22-1/2°, 45°, 167-1/2° to lamps if light output is asymmetric.
 4. Zonal lumens stated numerically in 10 degree increments (5 degree, 15 degree, etc.) as above.
- I. For area and roadway luminaires isocandela charts, coefficients of utilization, and IES roadway distribution classification.
- J. Supply photometric data for any fixture offered in substitution for a specified fixture.

1.6 SHOP DRAWINGS

- A. Submit shop drawings to the Commissioner for review in accordance with the requirements of the Contract Documents.
- B. Shop drawings shall include details and cuts of each fixture type scheduled herein, and shall include for each type the following information.
1. Type, lamping, size, material exterior and exterior, ballast type (where applicable), lenses, baffles, finishes, and means and methods of attachment.
 2. Include photometric data for each fixture.
 3. Submit thermal test data for ballasts regarding the tripping class P units based on the specified criteria.
- C. Submit reflected ceiling plans, sections and details so as to locate and define each fixture type and its location.
- D. Clearly indicate work to be provided by other trade subcontractors and coordinate accordingly.
- E. Indicate wiring and control circuits.
- F. To accommodate the seismic requirements, indicate supplementary spring type supports from the buildings structure for all fixtures 2 foot square in area and above.

1.7 SAMPLES

- A. After shop drawing approval, and prior to release for manufacturing, the Contractor shall furnish one sample of each fixture on the fixture schedule and contract drawings.



- B. Shipping: The samples shall be complete with specified lamp(s) ready for handing, energizing, and examining, and shall be shipped, to the Commissioner, or as otherwise advised.
- C. Sufficient time shall be allowed for thorough examination of the samples by the Commissioner.
- D. Samples are not returnable, nor included in quantities listed for a project.
- E. Samples must be actual working unit of materials to be supplied.

1.8 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements."
- B. Qualifications
 - 1. The Manufacturer shall be a specialty lighting firm who has been in the business of designing and manufacturing specialty lighting fixtures for not less than three (3) years.
 - 2. The Installer shall be a firm having trained personnel who have been in the business of installing specialty lighting for not less than three (3) years and shall provide a full-time field superintendent who shall be a representative of the installer during the installation and testing.
 - 3. Ballast manufacturers shall have been producing electronic ballasts for more than 3 years with a low failure rate.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand new, and manufacturer's name. Delivered material shall be identical to the reviewed submittals.
- B. Store materials under cover in a dry and clean location, off the ground. Remove materials which are damaged, or otherwise not suitable for installation from the job site and replace with acceptable materials.
- C. The fixtures shall be delivered to the job site fully fabricated and assembled and ready for installation. Lamps shall be shipped separately.
- D. For luminaires incorporating Alzak cones or reflector/cones for protection pending completion of the installation: these components shall be supplied bulk packed in cartons separate from the luminaires. Unit packaging of cones or reflector/cones with luminaires is not acceptable.

1.10 WARRANTY

- A. Installation checkout: Upon completion of initial system installation and fixture cleaning, the Contractor shall notify the Commissioner that the system has been completed. At this time, the Contractor shall verify that the installation has been done in full accordance with the Contract Documents and is in full and complete working order.



- B. Provide manufacturer's warrantee for all lighting fixtures and major components, except lamps, for a period of two (2) years after Substantial Completion of the project.
- C. Ballast shall carry three-year warranty.

PART 2 PRODUCTS

2.1 LUMINAIRES

A. TYPE B3

- 1. Fixture: Surface mounted direct distribution LED luminaire.
- 2. Construction: Powder-coated white extruded aluminum housing with snap-in frosted lens. Integral LED driver. The aircraft suspension kit shall have a white 1/16" cable mounting with a cable gripper for adjustment. The canopy cover plate shall be white powder-coated, aluminum and round (Ø 5") to cover the junction box.
- 3. Voltage: 120 Volt
- 4. Nominal Dimensions: Nominal fixture dimensions 3' length x 2-1/2" width x 2-11/16" depth.
- 5. Basis-of-Design Product: Subject to compliance with requirements provide Coronet LS2 Series – LS2-LED-4FT-LTG1- 3000K-120-SM, or comparable product by one of the following:
 - a. Zumtobel
 - b. Neo-Ray
 - c. Or approved equal.
- 6. Lamps: 24.75 watts LED, color temperature to be 3000K, 2192 lumens.
- 7. Driver: Integral LED driver, dimmable. Dimming driver specifications to be verified with electrical trade.
- 8. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.
- 9. Listing and Labeling: Fixture must be UL listed.

B. TYPE B4

- 1. Fixture: Surface mounted direct distribution LED luminaire.
- 2. Construction: Powder-coated white extruded aluminum housing with snap-in frosted lens. Integral LED driver. The aircraft suspension kit shall have a white 1/16" cable mounting with a cable gripper for adjustment. The canopy cover plate shall be white powder-coated, aluminum and round (Ø 5") to cover the junction box.



3. Voltage: 120 Volt
4. Nominal Dimensions: Nominal fixture dimensions 4' length x 2-1/2" width x 2-11/16" depth.
5. Basis-of-Design Product: Subject to compliance with requirements provide Coronet LS2 Series – LS2-LED-4FT-LTG1- 3000K-120-SM or comparable product by one of the following:
 - a. Zumtobel
 - b. Neo-Ray
 - c. Or approved equal.
6. Lamps: 33 watts LED, color temperature to be 3000K, 2921 lumens.
7. Driver: Integral LED driver, dimmable. Dimming driver specifications to be verified with electrical trade.
8. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.
9. Listing and Labeling: Fixture must be UL listed.

C. TYPE B5

1. Fixture: Surface mounted direct distribution LED luminaire.
2. Construction: Powder-coated white extruded aluminum housing with snap-in frosted lens. Integral LED driver. The aircraft suspension kit shall have a white 1/16" cable mounting with a cable gripper for adjustment. The canopy cover plate shall be white powder-coated, aluminum and round (Ø 5") to cover the junction box.
3. Voltage: 120 Volt
4. Nominal Dimensions: Nominal fixture dimensions 5' length x 2-1/2" width x 2-11/16" depth.
5. Basis-of-Design Product: Subject to compliance with requirements provide Coronet LS2 Series – LS2-LED-4FT-LTG1- 3000K-120-SM, or comparable product by one of the following:
 - a. Zumtobel
 - b. Neo-Ray
 - c. Or approved equal.
6. Lamps: 41.25 watts LED, color temperature to be 3000K, 3652 lumens.
7. Driver: Integral LED driver, dimmable. Dimming driver specifications to be verified with electrical trade.
8. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.



9. Listing and Labeling: Fixture must be UL listed.

D. TYPE B6

1. Fixture: Surface mounted direct distribution LED luminaire.
2. Construction: Powder-coated white extruded aluminum housing with snap-in frosted lens. Integral LED driver. The aircraft suspension kit shall have a white 1/16" cable mounting with a cable gripper for adjustment. The canopy cover plate shall be white powder-coated, aluminum and round (Ø 5") to cover the junction box.
3. Voltage: 120 Volt
4. Nominal Dimensions: Nominal fixture dimensions 6' length x 2-1/2" width x 2-11/16" depth.
5. Basis-of-Design Product: Subject to compliance with requirements provide Coronet LS2 Series – LS2-LED-4FT-LTG1- 3000K-120-SM or comparable product by one of the following:
 - a. Zumtobel
 - b. Neo-Ray
 - c. Or approved equal.
6. Lamps: 49.5 watts LED, color temperature to be 3000K, 4382 lumens.
7. Driver: Integral LED driver, dimmable. Dimming driver specifications to be verified with electrical trade.
8. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.
9. Listing and Labeling: Fixture must be UL listed.

E. TYPE C1

1. Fixture: Ceiling recessed circular LED luminaire.
2. Construction: Fully diffuse clear reflector, white flange.
3. Voltage: 120 Volt
4. Nominal Dimensions: Nominal fixture dimensions 4" diam aperture, housing 13" length x 10" width x 6-5/8" depth.
5. Basis-of-Design Product: Subject to compliance with requirements, provide Zumtobel Lighting Panos Infinity "tunableWhite" – P-INF-R150H-LED-927-65 LDO SM WH or comparable product by one of the following:
 - a. Edison Price



- b. Kurt Versen
- c. Or approved equal.

- 6. Lamps: 10 watts LED, color temperature to be 3000K, 1100 lumens, CRI 90, min. 50,000 hours rated life.
- 7. Driver: Integral LED driver, dimmable. Dimming driver specifications to be verified with electrical trade.
- 8. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.
- 9. Listing and Labeling: Fixture must be UL listed for wet locations.

F. TYPE C2

- 1. Fixture: Cast-in-concrete circular LED luminaire, with casting box.
- 2. Construction: Fully diffuse clear reflector, white flange.
- 3. Voltage: 120 Volt
- 4. Nominal Dimensions: Nominal fixture dimensions 4" diam aperture, housing 13" length x 10" width x 6-5/8" depth.
- 5. Basis-of-Design Product: Subject to compliance with requirements, provide Zumtobel Lighting Panos Infinity "tunableWhite" – P-INF-R150H-LED-927-65 LDO SM WH with 60 800 820 casting box or comparable product by one of the following:
 - a. Edison Price
 - b. Kurt Versen
 - c. Or approved equal.
- 6. Lamps: 10 watts LED, color temperature to be 3000K, 1100 lumens, CRI 90, min. 50,000 hours rated life.
- 7. Driver: Integral LED driver, dimmable. Dimming driver specifications to be verified with electrical trade.
- 8. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.
- 9. Listing and Labeling: Fixture must be UL listed for wet locations.

G. TYPE C3-S

- 1. Fixture: Surface mounted round LED luminaire.
- 2. Construction: Heavy gauge cold rolled steel housing. Spun steel trim.
- 3. Voltage: 120 Volt



4. Nominal Dimensions: Nominal fixture dimensions 48" diam aperture, housing 50.687" diam x 5" depth.
5. Basis-of-Design Product: Subject to compliance with requirements, provide Coronet PRD LED 4-30-LGTI-UNV-SM or comparable product from one of the following:
 - a. Vibia
 - b. Artemide
 - c. Or approved equal.
6. Lamps: 138 watts LED, color temperature to be 3000K, 12600 lumens, CRI 90, min. 50,000 hours rated life.
7. Driver: Integral LED driver, dimmable. Dimming driver specifications to be verified with electrical trade.
8. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.

H. TYPE C3-P

1. Fixture: Pendant stem-mounted round LED luminaire.
2. Construction: Heavy gauge cold rolled steel housing. Spun steel trim.
3. Voltage: 120 Volt
4. Nominal Dimensions: Nominal fixture dimensions 48" diam aperture, housing 50.687" diam x 5" depth.
5. Basis-of-Design Product: Subject to compliance with requirements, provide Coronet PRD LED 4 - 30 - LGTI - UNV - PX-S or comparable product from one of the following:
 - a. Vibia
 - b. Artemide
 - c. Or approved equal.
6. Lamps: 138 watts LED, color temperature to be 3000K, 12600 lumens, CRI 90, min. 50,000 hours rated life.
7. Driver: Integral LED driver, dimmable. Dimming driver specifications to be verified with electrical trade.
8. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.

I. TYPE E1

1. Fixture: Desk mounted task light LED luminaire.



2. Construction: Die-cast aluminum fixture, stamped steel housing for surface mount. Glass beam spread lens.
3. Voltage: 120 Volt
4. Nominal Dimensions: Nominal fixture dimensions housing (2) 19" long 21" from surface.
5. Basis-of-Design Product: Subject to compliance with requirements, provide Knoll T-Light or comparable product from one of the following:
 - a. Erco
 - b. Kurt Versen
 - c. Or approved equal.
6. Lamps: 9 watts LED, color temperature to be 3000K, 816 lumens, CRI 82, 50,000 hours rated life.
7. Driver: Integral LED driver, dimmable. Dimming driver specifications to be verified with electrical trade.
8. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.
9. Listing and Labeling: Fixture must be UL listed.

J. TYPE E2

1. Fixture: Recessed undercabinet circular LED luminaire.
2. Construction: Die-cast aluminum fixture, stamped steel housing for surface mount. Glass beam spread lens.
3. Voltage: 120 Volt
4. Nominal Dimensions: Nominal fixture dimensions 1-1/2" diam aperture, housing 2-1/4" diam x 7/8" depth.
5. Basis-of-Design Product: Subject to compliance with requirements, provide WAC lighting - HR-LED87-30-BK or comparable product from one of the following:
 - a. Erco
 - b. Kurt Versen
 - c. Or approved equal.
6. Lamps: 4.8watts LED, color temperature to be 3000K, 180 lumens, CRI 85, 70,000 hours rated life.
7. Driver: Integral LED driver, dimmable. Dimming driver specifications to be verified with electrical trade.
8. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.



9. Listing and Labeling: Fixture must be UL listed

K. TYPE F1

1. Fixture: Drive-over in-grade LED exterior location adjustable floodlight luminaire for installation with high pressure loads.
2. Construction: High tensile cast strength stainless steel. Heavy gauge trim ring. Tempered ½" thick clear safety glass. Weather tight operation achieved through use of molded high temperature silicone gasket. Flush top surface. Machined #4 stainless steel finish.
3. Voltage: 120 Volt
4. Nominal Dimensions: Nominal fixture dimensions 8-1/4" diam. x 5-1/8" depth.
5. Basis-of-Design Product: Subject to compliance with requirements, provide Bega – 77071 or comparable product from one of the following:
 - a. Erco
 - b. BK Lighting
 - c. Or approved equal.
6. Lamps: 29 watts LED, color temperature to be 3000K, 1348 lumens, CRI 80, min. 50,000 hours rated life.
7. Driver: Integral LED driver.
8. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.
9. Listing and Labeling: Fixture must be UL listed for exterior/wet locations.

L. TYPE F2

1. Fixture: Ground mounted flood light, suitable for wet locations.
2. Construction: Powder-coated dark grey aluminum housing with opal diffuser. Integral LED driver.
3. Voltage: 120 Volt
4. Nominal Dimensions: Nominal fixture dimensions 2-1/2" diam x 8-5/8" depth.
5. Basis-of-Design Product: Subject to compliance with requirements, provide BK lighting Delta Star or comparable product by one of the following:
 - a. Philips
 - b. Hydrel
 - c. Or approved equal.



6. Lamps: 40 watts LED, color temperature to be 3000K, 3320 lumens, CRI 75 min., min. 50,000 hours rated life.
7. Driver: Integral LED driver.
8. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.
9. Listing and Labeling: Fixture must be UL listed for wet locations.

M. TYPE F3

1. Fixture: Roof fascia mounted flood light with flat canopy, suitable for wet locations.
2. Construction: Powder-coated dark grey aluminum housing with opal diffuser. Integral LED driver.
3. Voltage: 120 Volt
4. Nominal Dimensions: Nominal fixture dimensions 2-1/2" diam x 8-5/8" depth.
5. Basis-of-Design Product: Subject to compliance with requirements, provide BK lighting Delta Star or comparable product by one of the following:
 - a. Philips
 - b. Hydrel
 - c. Or approved equal.
6. Lamps: 40 watts LED, color temperature to be 3000K, 3320 lumens, CRI 75 min., min. 50,000 hours rated life.
7. Driver: Integral LED driver.
8. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.
9. Listing and Labeling: Fixture must be UL listed for wet locations.

N. TYPE G1

1. Fixture: Wet Location Linear LED Strip Fixture.
2. Construction: Die-cast aluminum fixture, stamped steel housing for surface mount. Satin Ice White lens.
3. Voltage: 120 Volt
4. Nominal Dimensions: Nominal fixture dimensions 84" long strip. 1.68" x 1.75"



5. Basis-of-Design Product: Subject to compliance with requirements, provide Boca Flasher HPNLS-RT or comparable product from one of the following:
 - a. Ultrabright Architectural Series LED Strip Light
 - b. Cooper Lighting
 - c. Or approved equal.
6. Lamps: 8 watt / foot LED, color temperature to be 3000K, 519/ ft lumens, CRI 93.
7. Driver: Integral LED driver, Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.
8. Listing and Labeling: Fixture must be UL listed for exterior/wet locations.

O. TYPE H1

1. Fixture: Wall mounted square LED exterior location luminaire.
2. Construction: Die-cast marine grade aluminum housing with integral wiring compartment, shielded safety glass, reflector made of pure anodized aluminum. Black (BLK) powder coat to be 3mil thickness.
3. Voltage: 120 Volt
4. Nominal Dimensions: Nominal fixture dimensions 11" width x 11" height x 5 3/8" depth.
5. Basis-of-Design Product: Subject to compliance with requirements, provide Bega – 33 243 -BLK or comparable product from one of the following:
 - a. Erco
 - b. Kurt Versen
 - c. Or approved equal.
6. Lamps: 30 watts LED, color temperature to be 3000K, 4018 lumens, CRI 85, min. 50,000 hours rated life.
7. Driver: Integral LED driver.
8. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.
9. Listing and Labeling: Fixture must be UL listed for exterior/wet locations.

P. TYPE L1-EM

1. Fixture: Ceiling mounted emergency luminaire.



2. Construction: High-impact, mar-resistant, injection-molded thermoplastic covering, two directional PAR18 incandescent gimbal-type lighting heads, with maintenance-free lead calcium battery. AC line-latching, brown circuit and low battery voltage circuit.
3. Voltage: 120 Volt
4. Nominal Dimensions: Nominal fixture dimensions 12-1/4" length x 5" width x 2-1/2" depth.
5. Basis-of-Design Product: Subject to compliance with requirements provide Atlite PC1-10-BLK or comparable product by one of the following
 - a. McPhilben
 - b. Lithonia
 - c. Or approved equal.
6. Lamps: PAR18 incandescent.
7. Charger: Solid-state charger with emergency output short circuit protection.
8. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.
9. Listing and Labeling: Fixture must be UL listed for wet locations.

Q. TYPE W

1. Fixture – Optical Operation: Low profile steady burning blue incandescent fixture for security purposes.
2. Construction: Low profile surface mounted fixture with Type 4X gasket for dust- and water-tightness, featuring a polycarbonate dome, polyamide base, and built-in strain relief.
3. Voltage: 120 volt
4. Nominal Dimensions: Nominal fixture diameter to be 3", and nominal fixture height to be 2.5".
5. Basis-of-Design Product: Subject to compliance with requirements provide Federal Signal Corporation LP2-120B VAC-6W, #K8107195A-01 or comparable product by one of the following
 - a. Edwards Signaling
 - b. Automation Systems Interconnect
 - c. Or approved equal.
6. Lamps: Bayonet Base 6W Incandescent Lamp with a rated life of 1,500 hours.
7. Ballast: N/A



8. Samples: Samples may be required for submitted fixtures prior to approval unless manufacturer is noted above. Contractor is responsible for providing any requested samples.
9. Listing and Labeling: Fixture must be UL listed.

R. TYPE ELV-4

1. Fixture – Wall mounted utility luminaire.
2. Construction: Cast-aluminum housing with corrosion resistant paint in an industrial grey finish, and a gasket seal to protect against moisture and dust.
3. Voltage: 120 volt
4. Nominal Dimensions: Nominal fixture dimensions 4-1/2" diam x 7-7/16" depth x 11-5/16" height.
5. Basis-of-Design Product: Subject to compliance with requirements, provide Lithonia OLVTWM, or comparable product by one of the following
 - a. McPhilben
 - b. Lithonia
 - c. Or approved equal.
6. Lamps: 15 watts LED, color temperature to be 4000K, 50000 hours rated life.
7. Ballast: N/A
8. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.
9. Listing and Labeling: Fixture must be UL listed.

S. TYPE EX-1

1. Construction: Die-cast aluminum housing and face plate. Stencil to be aluminum finish, with 8" red letters. Battery and electronics to be contained within the housing for multi-mount function.
2. Voltage: 120 volt
3. Nominal Dimensions: Nominal height of the housing is 11", nominal width is 16¼", and nominal depth is 2¼". Total height with mounting kit is 12", and a total depth of 4½".
4. Basis-of-Design Product: Subject to compliance with requirements, provide Atlite XLA2-8-D-R-1, or comparable product by one of the following
 - a. McPhilben



- b. Lithonia
- c. Or approved equal.
- 5. Lamps: LED illumination strip.
- 6. Ballast: N/A
- 7. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.
- 8. Listing and Labeling: Fixture must be UL listed.

T. TYPE EX-2

- 1. Construction: Die-cast aluminum housing and face plate, with a black, low-profile mounting canopy kit. Stencil to be aluminum finish, with 8" red letters. Battery and electronics to be contained within the housing for multi-mount function.
- 2. Voltage: 120 volt
- 3. Nominal Dimensions: Nominal height of the housing is 11", nominal width is 16¼", and nominal depth is 2¼". Total height with mounting kit is 12", and a total depth of 4½".
- 4. Basis-of-Design Product: Subject to compliance with requirements, provide Atlite XLA2-8-D-R-1C-DCB or comparable product by one of the following
 - a. McPhilben
 - b. Lithonia
 - c. Or approved equal.
- 5. Lamps: LED illumination strip.
- 6. Ballast: N/A
- 7. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.
- 8. Listing and Labeling: Fixture must be UL listed.

U. TYPE EX-3

- 1. Construction: Die-cast aluminum housing and face plate, with a black, low-profile mounting canopy kit. Stencil to be aluminum finish, with 8" red letters. Battery and electronics to be contained within the housing for multi-mount function.
- 2. Voltage: 120 volt



3. Nominal Dimensions: Nominal height of the housing is 11", nominal width is 16¼", and nominal depth is 2¼". Total height with mounting kit is 12", and a total depth of 4½".
4. Basis-of-Design Product: Subject to compliance with requirements, provide Atlite XLA2-8-D-R-2C-DCB, or comparable product by one of the following
 - a. McPhilben
 - b. Lithonia
 - c. Or approved equal.
5. Lamps: LED illumination strip.
6. Ballast: N/A
7. Samples: Samples may be required for submitted fixtures prior to approval. Contractor is responsible for providing any requested samples.
8. Listing and Labeling: Fixture must be UL listed.

2.2 FIXTURE CONSTRUCTION (GENERAL)

- A. All materials, accessories, and other related fixture parts shall be new and free from defects which in any manner may impair their character, appearance, strength, durability and function, and be effectively protected from any damage or injury from the time of fabrication to the time of delivery and until final acceptance of the work.
- B. Enclosures: Fabricate fixture enclosures with a minimum of #20 gauge (0.0359 inch) thick cold rolled sheet steel. Enclosures may be constructed of other metals, provided they are equivalent in mechanical strength and acceptable for the purpose. Fabricate lighting fixtures to be finished in vitreous porcelain enamel from a minimum of #20 gauge enameling steel.
- C. Sheet Metal Work: All sheet metal work shall be free from tool marks and dents, and shall have accurate angles bent as sharp as compatible with the gauges of the required metal. All intersections and joints shall be formed true of adequate strength and structural rigidity to prevent any distortion after assembly.
- D. Housings shall be so constructed that all electrical components are easily accessible and replaceable without removing fixtures from their mountings, or disassembly of adjacent construction.
- E. Castings: All castings shall be exact replicas of the approved patterns and shall be free of sand pits, blemishes, scales and rust, and shall be smoothly finished. Tolerance shall be provided for any shrinkage of the metal castings in order that the finished castings will accurately fit in their designated locations.
- F. All lamp sockets in lighting fixtures shall be suitable for the indicated lamps and shall be set so that lamps are positioned in optically correct relation to all lighting fixture components. If adjustable socket positions are provided, socket should be preset in



factory for lamp specified. If different socket positions are specified for same fixture, sockets shall be preset for each type, and cartons marked accordingly.

- G. All fixtures shall be completely wired at the factory.
- H. Mounting Frames and Rings: If ceiling system requires, each recessed and semi-recessed fixture shall be furnished with a mounting frame or ring compatible with the ceiling in which they are to be installed. The frames and rings shall be one piece or constructed with electrically-welded butt joints, and of sufficient size and strength to sustain the weight of the fixture.
- I. Light leaks between ceiling trims of recessed lighting equipment and the ceilings will not be tolerated. If fixture is used in partially transparent ceiling, light leaks above the ceiling line will not be tolerated.
- J. Yokes, brackets and supplementary supporting members needed to mount lighting fixtures to carrier channels or other suitable ceiling members shall be furnished and installed by the Contractor.
- K. Outdoor Fixtures: Fixtures for use outdoors or in areas designated as damp locations shall be suitably gasketed to prevent the entrance of moisture. Provide approved wire mesh screens for ventilations openings.
- L. Hardware: For steel and aluminum fixtures, all screws, bolts, nuts and other fastenings and latching hardware shall be cadmium or equivalent plated. For stainless steel fixtures, all hardware shall be stainless steel. For bronze fixtures, all hardware shall be stainless steel or bronze.
- M. Temperature: All fixtures and ballasts must operate within the temperature limits of their design and as specified by Underwriters' Laboratories, Inc. in the applications and mounting conditions herein specified.
- N. Adjustable Angle Fixtures: Each lighting fixture which has a beam angle adjustment shall have reliable angle locking devices.
- O. Oval Beam Fixtures: Each lighting fixture which has a lamp with an oval shape beam pattern shall contain lamp orientation locking devices to ensure that beam orientation is not distributed during future lamp replacement or cleaning.

2.3 REFLECTORS & TRIMS

- A. Installation: Reflectors, reflector cones and visible trim of all lighting fixtures shall not be installed until completion of plastering, ceiling tile work, painting and general clean-up. They shall be carefully handled to avoid scratching or finger-printing and shall be, at the time of acceptance by the City of New York, completely clean.
- B. All Alzak parabolic cones shall be guaranteed against discoloration for a minimum of ten years, and, in the event of premature discoloration, shall be replaced by the Manufacturer, including materials and the cost of labor. Reflectors for fluorescent fixtures using triphosphor lamp technology shall not produce a visible "rainbow" of light.



- C. Aluminum reflectors shall be finished specular, semi-specular, or diffuse as required and shall meet or exceed Alzak specifications. Minimum requirements of reflector finishes for interior and exterior service shall be as follows:

Minimum weight of coating per description of service.	Minimum reflectance percent square inch.	Specular	Diffuse
Normal interior commercial service	5.0	83.0	75.0
General interior industrial and exterior work reflector protected by glass covering.	7.5	82.0	73.0
Exterior industrial and commercial reflector not protected.	10.0	78.0	75.0
Exterior marine service reflector not protected.	13.0	78.0	65.0

2.4 LENSES

- A. Plastic for lenses and diffusers shall be formed of colorless 100% virgin acrylic as manufactured by Rohm & Haas, Dupont, Celanese or approved equal. The quality of the raw material must exceed IES, SPI, and NEMA Specifications by at least 100% which, as a minimum standard, shall not exceed a yellowness factor of 3 after 2,000 hours of exposure in the Fade-meter or as tested by an independent test laboratory. Acrylic plastic lenses and diffusers shall be properly cast, molded or extruded as specified, and shall remain free of any dimensional instability, discoloration, embrittlement, or loss of light transmittance for at least 15 years.
- B. Glass used for lenses, refractors, and diffusers in incandescent lighting fixtures shall be tempered for high impact and heat resistance. The glass shall be crystal clear in quality with a transmittance of not less than 88%. For exterior fixtures use tempered glass. For fixtures directly exposed to the elements and aimed above the horizontal with a radiant energy of 4.16 watts per square inch or greater, use Vycor glass.
- C. Where optical lenses are used, they shall be free from spherical and chromatic aberrations and other imperfections which may hinder the functional performance of the lenses.
- D. Mechanical: All lenses, louvers, or other light diffusing elements shall be removable, but positively held so that hinging or other normal motion will not cause them to drop out.
- E. Cleaning: All lenses shall be turned over to the City of New York clean and free of dust.

2.5 LAMP HOLDERS

- A. Incandescent: Body: porcelain; Screw Shall: nickel-plated brass, prelubricated with silicone compound.
- B. Fluorescent: Body: white urea plastic; Contacts: silver-plated phosphor bronze.

2.6 FINISHES

- A. Painted Surfaces: Synthetic enamel, with acrylic, alkyd, epoxy, polyester, or polyurethane base, light stabilized, baked on at 350° Fahrenheit minimum, catalytically or photochemically polymerized after application.
- B. White finishes: minimum of 85 percent reflectance.
- C. Ceiling opening frames shall either be manufactured of non-ferrous metal, or be suitably rustproofed after fabrication.
- D. Selection: Unless otherwise noted, finishes shall be as selected by the Commissioner.
- E. Undercoat: Except for stainless steel give ferrous metal surfaces a five stage phosphate treatment or other acceptable base bonding treatment before final painting and after fabrication.
- F. Unpainted non-reflecting surfaces shall be satin finished and coated with a baked-on clear lacquer to preserve the surface. Where aluminum surfaces are treated with an anodic process, the clear lacquer coating may be omitted.
- G. Unpainted Aluminum Surfaces: Finish interior aluminum trims with an anodized coating of not less than 7 mg. per square inch, of a color and surface finish as selected by the Commissioner. Finish exterior aluminum and aluminum trims with an anodized coating of not less than 35 mg. per square inch, of a color and surface finish as selected by the Commissioner.
- H. Porcelain Enamel Surfaces: Apply porcelain finishes smoothly. Finish shall be not less than 7.5 mils thick of non-yellowing, white, vitreous porcelain enamel with a reflectance of not less than 85%.

2.7 LAMPS

- A. Manufacturer: Lamps shall be manufactured by General Electric, Philips, Osram/Sylvania, or approved equal. Unless otherwise noted, all lamps of a given fixture designation and lamp type shall be supplied by the same manufacturer.
- B. Provide lamps for all lighting fixtures (furnished as part of the electric work).
- C. Incandescent and tungsten halogen lamps shall not be operated, other than for initial testing, prior to final inspection, lighting control programming and/or turnover of finished space to the City of New York. If incandescent or tungsten halogen lamps are operated by the contractor during construction, all lamps must be replaced by the contractor prior to the turnover to the City of New York.



- D. Compact fluorescent, linear fluorescent, metal halide and LED lamps shall not be operated, during construction for a period of more than four (4) months prior to turn over of the finished space to the City of New York. If lamps are operated longer than four (4) months prior to turnover to the City of New York, all lamps must be replaced by the contractor.

2.8 FLUORESCENT LIGHTING FIXTURES

- A. General Construction and Materials: Housing end plates, socket bridges, reflectors, wiring channels and ballast covers shall be die formed of not less than #20 gauge (0.0359 inch thick) cold rolled steel unless specified otherwise.
- B. Lampholders shall be heavy white with definite locking-in feature and silver-plated contacts for proper lamp operation and life. Outdoor lampholders shall be neoprene gasketed and compression type. Sockets with open-circuit voltage over 300 volts: safety type and designed to open supply circuit on lamp removal.
- C. Mount lamps on rapid-start circuits within one inch of grounded metal, minimum one inch wide, as long as lamp.
- D. Construct fixtures so that ballast may be serviced or replaced without removal of fixture housing.

2.9 FLUORESCENT BALLASTS

- A. Standard Magnetic: Where called for in the Lighting Fixture Schedule, provide two lamp and/or single lamp standard magnetic ballasts in any one fluorescent fixture. Fluorescent lighting fixture magnetic ballasts (except single reactor type) shall be equipped with an internal, automatic resetting thermal protector adjacent to the coils, and on-time non-resetting thermal device to protect the capacitor. Ballasts shall be acceptable and listed by Underwriters' Laboratories Inc., as Class "P". Ballasts must have the manufacturer's best sound rating, and the sound rating indicated on the ballast. Ballasts shall be high power factor type, and shall be designed and constructed to maintain a case temperature not greater than 90°C when operated at a room ambient of 50°C when tested in accordance with UL and CBM standards. Ballasts shall be designated for single frequency operation 60 Hz. Nominal, and shall operate at the nominal voltages indicated on label, 120 volt and/or 277 volt as required.
- B. Electronic: Where called for in the Lighting Fixture Schedule, provide electronic ballasts for fluorescent light fixtures. Contractor is responsible for coordination of ballast compatibility with specified lamps. Electronic ballasts shall be acceptable and listed by Underwriters' Laboratories Inc., and Class "P" thermally protected. Ballasts shall have a power factor greater than 0.90, ballast factor equal to 0.93, total harmonic distortion less than 10%, and lamp current crest factor less than or equal to 1.6. Ballasts shall have a minimum starting temperature of 10° Celsius. Ballasts shall be free of Polychlorinated biphenyls (PCB's). Ballasts shall be designated for frequency of operation greater than 25 KHz nominal, and shall operate at the nominal voltages indicated on label, 120 volt and/or 277 volt as required.

- 1. It shall be possible to operate ballasts for different length lamps on a single circuit.



2. It shall be possible to operate multiple lamp ballasts on a single circuit with no perceptible difference in lamp light output.
3. Fixture and ballast combination shall be inaudible in a 27 db room ambient.
4. Ballast shall comply with all applicable state and federal efficiency standards.
5. Ballasts shall comply with FCC and NEMA limits governing electromagnetic and radio frequency interference and shall not interfere with operation of other normal electrical equipment.
6. Ballasts shall meet all applicable ANSI and IEEE standards regarding harmonic distortion and surge protection.
7. Ballasts shall not be affected by lamp failure and shall yield normal lamp life.
8. Ballasts shall operate at an input frequency of 60 Hz and an input voltage of 108 to 132 (120V models) or 249 to 305 (277V models).
9. Ballasts that operate as a parallel circuit shall allow remaining lamp(s) to maintain full output if companion lamp(s) fail.

2.10 INCANDESCENT AND HALOGEN LIGHTING FIXTURES

- A. General Construction and Materials: Incandescent lighting fixtures shall be listed and labeled by Underwriters' Laboratories, Inc., for installation in fireproof or non-fireproof construction, damp or wet locations, as required.
- B. Aluminum reflectors shall be Alzak (finish as selected) or as authorized, and not less than 0.057 inch thick unless specified otherwise.
- C. Lampholders shall be UL listed, and be heavy duty type constructed of high grade porcelain. Provide medium base sockets for lamps to and including 250 watts and mogul based sockets from 300 watts up to 1500 watts (rated for 1500 watts, 600 volt service) unless specified otherwise.
- D. Tungsten Halogen: Incandescent lighting fixtures utilizing tungsten halogen sources shall be designed and constructed so that lamp seal temperatures do not exceed 350°C at an ambient of 25°C when tested in accordance with UL Standard #57 and shall maintain an operating bulb wall temperature of approximately 600°C and not less than 250°C.
- E. Lead wires for fixtures utilizing tungsten halogen sources shall be rated for not less than 200°C operation, but shall be rated for 250°C if temperature warrants.
- F. Temperature on reflectors shall not exceed 205°C at any point.
- G. Junction Boxes: All fixtures supplied for recessing in suspended ceiling shall be supplied with prewired junction boxes.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. Installation: Do not scale electrical drawings for exact location of the lighting fixtures. In general, the architectural reflected ceiling plans indicate the proper locations of lighting fixtures.
- B. Appurtenances: Install each fixture properly and safely. Furnish and erect hangers, rods, mounting brackets, supports, frames, and other equipment requirement.
- C. Coordination: Furnish lighting fixtures complete with appurtenances required for the proper, safe and distortion-free installation in the various surfaces in which they appear. Determine surface types from the Architectural drawings.
- D. Instructions: Each lighting fixture shall be packaged with complete instructions and illustrations showing how to install. Install lighting fixtures in strict conformance with manufacturer's recommendations and instructions.
- E. Rigidly align continuous rows of lighting fixtures for true in-line appearance.
- F. Pendant Fixtures: Install pendant lighting fixtures plumb and at a height from the floor as specified on the drawings. In cases where conditions make this impractical, refer to the Commissioner for a decision. Use ball aligners and canopies on pendant fixtures unless noted otherwise.
- G. Do not install fixtures and/or parts such as finishing plates and trims for recessed fixtures until all plastering and painting that may mar fixtures' finish has been completed.
- H. Mechanical Rooms: Lighting fixture locations in mechanical and electrical equipment rooms are approximate. Coordinate mounting height and location of lighting fixtures to clear mechanical, electrical and plumbing equipment and to illuminate adequately meters, gauges and equipment.
- I. Support all lighting fixtures independently of duct work or piping.
- J. Concealment: Whenever a fixture or its hanger canopy is applied to a surface mounted outlet box, a finishing ring shall be utilized to conceal the outlet box.
- K. Splices in internal wiring shall be made with approved insulated "wire nut" type mechanical connectors, suitable for the temperature and voltage conditions to which they are subjected.
- L. All wire utilized for connections to or between individual lamp sockets and lamp auxiliaries (i.e., wires which do not constitute "through circuit" wiring) shall be suitable for temperature, current, and voltage conditions to which it is subjected.



- M. Install reflector cones, baffles, aperture plates, light controlling element for air handling fixtures, and decorative elements after completion of ceiling tiles, painting and general cleanup.
- N. Replace blemished damaged or unsatisfactory fixtures as directed.

3.3 AIMING AND ADJUSTMENT

- A. All adjustable lighting units shall be aimed, focused, locked, etc. under the supervision of the Commissioner. All aiming and adjusting shall be carried out after the entire installation is complete. All ladders, scaffolds, etc. required shall be furnished by the Contractor at the direction of the Commissioner. As aiming and adjusting is completed, locking set-screws and bolts and nuts shall be tightened securely.
- B. Night Work: Where possible, unit shall be focused during the normal working day. However, where daylight interferes with seeing, aiming shall be accomplished at night.

3.4 CLEANUP

- A. At the time of final acceptance by the City of New York, all lighting fixtures shall have been thoroughly cleaned with materials and methods recommended by the manufacturers, all broken parts shall have been recommended by the manufacturers, all broken parts shall have been replaced, and all lamps shall be operative.

3.5 MAINTENANCE

- A. The Contractor shall be responsible for obtaining from his supplying lighting manufacturers, for each type of lighting fixture, a recommended maintenance manual including:
 - 1. Tools required.
 - 2. Types of cleaners to be used.
 - 3. Replacement parts identification lists.
 - 4. Final, as-built shop drawings.
- B. Six (6) bound copies of this material shall be forwarded to the City of New York.

END OF SECTION 26 50 00

SECTION 27 05 26 - GROUNDING AND BONDING FOR COMMUNICATIONS 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. This section includes the minimum requirements for grounding, earthing, and bonding of equipment installed under or referred to elsewhere in Division 27.
- B. Related Section 27 10 00
- C. Reference Material: Refer to the most recent version, update or addenda:
 - 1. TIA-607-B: Generic Telecommunications Bonding and Grounding (Earthing) For Customer Premises, Edition B, Publish Date 2012.

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 ACTION SUBMITTALS

- A. Product Data:
 - 1. Submit all product data in accordance with DDC General Conditions and Section 271000
- B. Shop drawings:
 - 1. Submit shop drawings indicating:
 - a. Single-line grounding schematic indicating:
 - i) Location of each bus bar
 - ii) conductor gauge for each grounding, earthing, bonding, or equalizing connection
 - iii) Bus bar labels for each grounding, earthing, bonding, or equalizing connection
- C. As-Built Drawings:
 - 1. Submit all as-built drawings in accordance with the requirements of Section 271000
 - 2. Single-line grounding schematic

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Component manufacturer shall be ISO 9001:2000 and offer products that are RoHS compliant.

PART 2 PRODUCTS

2.1 WALL-MOUNT BUSBARS

- A. Manufacturer List:
 - 1. Cooper B-line
 - 2. Chatsworth Products
 - 3. Panduit
 - 4. Or approved equal
- B. Telecommunications Main Grounding Busbar (TMGB):
 - 1. The Telecommunications Main Grounding Busbar shall be located where indicated on the drawings.
 - 2. Telecommunications Main Grounding Busbar (TMGB) shall be constructed of .25" (6.4 mm) thick solid copper bar.
 - 3. The busbar shall be 4" (100 mm) high and 20" (510 mm) long and shall have 30 attachment points (two rows of 15 each) for two-hole grounding lugs.
 - 4. The hole pattern for attaching grounding lugs shall meet the requirements of TIA-607 and shall accept 27 lugs with 5/8" (15.8 mm) hole centers and 3 lugs with 1" (25.4 mm) hole centers.
 - 5. The busbar shall include wall-mount stand-off brackets, assembly screws and insulators creating a 4" (100 mm) standoff from the wall.
 - 6. The busbar shall be UL Listed as grounding and bonding equipment.
- C. Telecommunications Grounding Busbar (TGB):
 - 1. A Telecommunications Grounding Busbar (TGB) shall be located where indicated on the drawings.
 - 2. Telecommunications Grounding Busbar (TGB) shall be constructed of .25" (6.4 mm) thick solid copper bar.
 - 3. The busbar shall be 2" (50 mm) high and 12" (300 mm) long and shall have 9 attachment points (one row) for two-hole grounding lugs.
 - 4. The hole pattern for attaching grounding lugs shall meet the requirements of TIA-607 and shall accept 6 lugs with 5/8" (15.8 mm) hole centers and 3 lugs with 1" (25.4 mm) hole centers.
 - 5. The busbar shall include wall-mount stand-off brackets, assembly screws and insulators creating a 4" (100 mm) standoff from the wall.
 - 6. The busbar shall be UL Listed as grounding and bonding equipment.
 - a. Bonding Accessories



- D. Rack and Cabinet Ground Busbar
 - 1. Vertical rack-mount busbar shall be constructed of 1/4" (6.4 mm) thick by 5/8" (15.8 mm) high hard-drawn electrolytic tough pitch 110 alloy copper bar.
 - 2. Bar shall be 72" (1830 mm) high (as specified below) for mounting vertically on relay racks.
 - 3. 72" (1830 mm) high bar shall have 13 threaded 1/4-20 attachment points for two-hole lugs with 5/8" (15.8 mm) hole centers and two pairs of threaded studs (one at top, one at bottom) for two-hole lugs with 1" (25.4 mm) hole centers.
 - 4. Each bar shall include a #2 AWG two-hole compression lug for 1" (25.4 mm) hole centers, insulator blocks and mounting screws.
 - 5. Bar shall be UL Listed as grounding and bonding equipment.
- E. Two Mounting Hole Ground Terminal Block:
 - 1. Ground terminal block shall be made of electroplated tin aluminum extrusion.
 - 2. Ground terminal block shall accept conductors ranging from #14 AWG through 2/0.
 - 3. The conductors shall be held in place by two stainless steel set screws.
 - 4. Ground terminal block shall have two 1/4" (6.4 mm) holes spaced on 5/8" (15.8 mm) centers to allow secure two-bolt attachment to the rack or cabinet.
 - 5. Ground terminal block shall be UL Listed as a wire connector.
- F. Compression Lugs:
 - 1. Compression lugs shall be manufactured from electroplated tinned copper.
 - 2. Compression lugs shall have two holes spaced on 5/8" (15.8 mm) or 1" (25.4 mm) centers, as stated below, to allow secure two bolt connections to busbars.
 - 3. Compression lugs shall be sized to fit a specific size conductor, sizes #6 to 4/0, as stated below.
 - 4. Compression lugs shall be UL Listed as wire connectors.
- G. Antioxidant Joint Compound:
 - 1. Oxide inhibiting joint compound for copper-to-copper, aluminum-to-aluminum or aluminum-to-copper connections.
- H. Accessory Products:
 - 1. Provide any accessory products related to the UTP connectors required to provide a complete and functional infrastructure system.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION GENERAL

- A. The radius of any bend in any bonding, earthing, or grounding conductors shall not be less than 8 inch.
- B. The angle of any bend in the bonding, earthing, or grounding conductors shall not be less than 90 degrees.
- C. The installation bonding, earthing, or grounding conductors inside ferrous metallic conduit is neither required nor desired. Use PVC where grounding conductors must be passed through walls. If AHJ requires metallic conduit, the grounding conductor must be bonded to the sleeve on both ends using a listed grounding bushing.
- D. Splices, taps, or connections to the Connections to the grounding conductor with other grounding conductors must be made using exothermic welding or irreversible compression type connections.
- E. Only connection devices that require the complete removal of the conductor jacket or insulation and result in a connection to the complete conductor surface area shall be suitable for use.
- F. All mechanical and compression-type connection devices shall be UL 486A listed and of the proper size for the application. These connection devices shall be tin-plated when connected with steel, galvanized steel or aluminum surfaces.
- G. All clamps and compression-type connection devices shall be UL 486A listed and shall maintain a minimum 88% conductivity rating.
- H. Compression systems shall include crimped die index and company logo for purposes of inspection.
- I. No more than one clamp, fitting or lug may be attached by the same bolt or bolts. An exception to this is when a jumper from a terminal strip or other internal connection point of the same equipment must be bonded to the equipment grounding conductor.
- J. No more than one conductor shall be connected by a single clamp, fitting or lug unless the clamp, fitting, or lug is listed for multiple conductors.
- K. Solid conductors shall be attached to lugs and to other conductors by irreversible high compression crimping process. Only listed irreversible compression type lugs and connection devices shall be used.
- L. Connections between dissimilar metals shall not be made unless the conductors are separated by a suitable material that is a part of the attachment device. Only attachment devices listed and approved for use with the specific dissimilar metals may be used for this purpose.
- M. An appropriate type of listed, conductive anti-oxidant shall be applied on all connections of dissimilar metals. Copper enhanced anti-oxidant compound should be used between copper,



brass, bronze and tin-plated bonding surfaces. Zinc enhanced anti-oxidant compound should be used between tin-plated connection devices and steel, galvanized steel, zinc-chromate steel, aluminum, and tin-plated copper bus bar bonding surfaces.

- N. Where threaded or tapped holes are provided for attachment purposes, a star or split type lock washer shall be installed under the head of the screw or bolt and/ or between the nut and the ground bus bar.
- O. Self-tapping or sheet metal type screws shall not be used for attaching ground or grounding conductors to any surface. (See NFPA 70-2005, Article 250.8 for additional information.)
- P. Paint, enamel, lacquer, or other nonconductive coatings shall be removed from threads and surface areas where connections are made (NFPA 70-2005, Article 250.12). Use of a star washer shall not alleviate the requirement to remove nonconductive coatings from attachment surfaces. Star or split type washers shall not be installed between the conductive surfaces.
- Q. All two-hole lugs shall have bolts in both holes with lock washers placed on the nut side of the bonding surface.
- R. All securing hardware for mechanically bolted clamps and lugs shall be stainless steel or approved for the application.

3.3 GROUND TERMINAL BLOCK

- A. Racks and cabinets shall be bonded to the TMGB or TGB.
- B. Minimum bonding connection to racks and cabinets shall be made with a rack-mount two-hole ground terminal block sized to fit the conductor and rack and installed according to manufacturer recommendations.
- C. Remove paint between rack/cabinet and terminal block, clean surface and use antioxidant between the rack and the terminal block to help prevent corrosion at the bond.

3.4 WALL-MOUNT BUSBARS

- A. Process:
 - 1. Attach busbars to the wall with appropriate hardware according to the manufacturer's installation instructions.
 - 2. Conductor connections to the TMGB or TGB shall be made with 2-Hole Bolt-On Compression Lugs sized to fit the busbar and the conductors.
 - 3. Each lug shall be attached with stainless steel hardware after preparing the bond according to manufacturer recommendations and treating the bonding surface on the busbar with antioxidant to help prevent corrosion at the bond.
 - 4. The wall-mount busbar shall be bonded to ground as part of the overall Telecommunications Bonding and Grounding System.

3.5 CABLE TRAYS

- A. Bonding jumpers shall be installed at all cable tray splices and connection points unless the cable tray has labeling that identifies it as suitable for use as a grounding (earthing) conductor and it meets the requirements of NFPA 70-2005, Article 392.7(B). Cable trays shall have bolted splices and the connection points use splined shoulder bolts which bite into the side rail of the cable tray to ensure a positive bond between sections. All bolts must be properly installed at each splice in the cable tray system per the manufacturer's instructions. Care must be taken to ensure a continuous electrical path. Bonding jumpers must be used where discontinuities such as expansion splice plates and hinged splice plates exist.
- B. Cable trays shall not be utilized as a ground bus conductor for equipment or ancillary support apparatus.

3.6 MDF/DATA CENTER GROUNDING

- A. The data center Telecommunications Ground Busbar (TGB) shall be the single point grounding system.
- B. Data Center grounding bus conductor
- C. Provide ground bus conductor throughout data center for bonding the following:
 - 1. IT equipment cabinets
 - 2. IT equipment racks
 - 3. IT Cable trays
 - 4. IT Conduits
- D. Provide support for Data Center grounding bus conductor so that it is outside the cable tray and is no less than 2" from the any part of the cable tray.

3.7 TR /IDF ROOM GROUNDING

- A. The TR room Telecommunications Ground Busbar (TGB) shall be the single point grounding system.
- B. TR room grounding bus conductor
- C. Provide ground bus conductor throughout TR Rooms for bonding the following:
 - 1. IT equipment racks
 - 2. IT Cable trays
 - 3. IT Conduits
- D. Provide support for TR room grounding bus conductor so that it is outside the cable tray and is no less than 2" from the any part of the cable tray.



- E. Tap of grounding bus conductor, using approved tap, to bond racks and rack bus bar, ref to drawing details.
- F. The raised floor grounding system (refer to electrical drawings) shall have one connection to the TR Room TGB. No equipment installed under division 27 shall be connected to the raised floor grounding system.

END OF SECTION 27 05 26

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 27 05 28 PATHWAYS FOR COMMUNICATIONS 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 RELATED SECTION

- A. 271000 Structured Cabling

1.3 SUMMARY

- A. Provides specifications for cable tray (ladder rack and basket type) containment systems to provide pathways support to telecommunications cables traveling outside of non-contiguous cable support systems (J-hooks) and conduits.
- B. Reference Material: Refer to the most recent version, update or addenda.
 - 1. ASTM International:
 - 2. ASTM A36 – Specification for Carbon Structural Steel
 - 3. ASTM A1011 – Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy with Improved Formability.
 - 4. ASTM A513 – Specification for Electric – Resistance- Welded Carbon And Alloy Steel Mechanical Tubing.
 - 5. ASTM B633 – Specification for Electro-Deposited Coatings of Zinc on Iron and Steel.
 - 6. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - 7. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 8. National Electrical Manufacturers Association:
 - a. NEMA FG 1 - Nonmetallic Cable Tray Systems
 - b. NEMA VE 1 - Metal Cable Tray Systems
 - c. NEMA VE 2 - Metal Cable Tray Installation Guidelines

1.4 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.5 ACTION SUBMITTALS

- A. Product Data:
 - 1. Submit all product data in accordance with DDC General Conditions and Section 271000.



2. Product data to include, but not limited to materials, finishes, approvals, load ratings, and dimensional information.
 3. Submit product data and samples of anchoring device and narrative of installation procedure.
- B. Shop Drawings:
1. Submit all shop drawings in accordance with DDC General Conditions and Section 271000.
 2. Shop drawings shall depict cable tray routes, types, dimensions, support points, finishes and calculations determining support spans and load ratings.
- C. Closeout Submittals:
1. Project Record Documents: Record actual routing of cable tray and locations of supports.

1.6 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Qualifications – Manufacturer:
1. Component manufactures shall be ISO 9001:2000 and offer products that are RoHS compliant.
 2. All items of a given type shall be the products of the same manufacturer.
 3. Cable trays components and systems shall be classified by Underwriters Laboratories (UL)
 4. Cable trays components and systems shall be of uniform quality and appearance.
 5. All items of a given type shall be the products of the same manufacturer.

PART 2 - PRODUCTS

2.1 BASKET CABLE TRAY SECTIONS AND COMPONENTS (where drawings indicate cable tray and/or basket tray)

- A. Manufacturer List:
1. Cooper B-line
 2. Chatsworth – Cable Runway System of Products
 3. Hubbell
 4. GS Metals Part # FT2x06x10
 5. FlexTray Part # FT2x12x10
 6. Or approved equal
- B. Description:
1. Wire basket shall be made of high strength steel wires and formed into a standard 2 inch by 4 inch 2 inch deep x 6 or 12 inch wide wire mesh pattern with intersecting wires welded together.
 2. All mesh sections must have at least one bottom longitudinal wire along entire length of straight section.
 3. Wire basket tray sizes shall conform to the following nominal criteria:
 - a. Straight sections shall be furnished in standard 118 inch lengths.
 - b. Wire diameter shall be 0.196" (5mm) minimum on all mesh sections.



- c. Wire tray shall be provided in the sizes indicated on the drawings.
4. System shall be installed as an Equipment Ground Conductor (EGC), all splicing assemblies shall be UL Classified or CSA approved as an EGC. Powder coated wire mesh cable tray must have paint completely removed at all contact points of splice/ground bolt attachments.
5. Wire basket try shall be powder coated black with an average paint thickness of 1.2mils (30microns) to 3.0mils (75microns).
6. All fittings shall be field formed, from straight sections, in accordance with manufacturer's instructions.
7. Contractor must provide documented proof for the wire basket try system.
8. All fittings shall be field formed, from straight sections in accordance with manufacturer's instructions.
9. Wire basket cable tray supports shall be center support hangers, trapeze hangers or wall brackets from manufacturer listed in 2.1A, or approved equal.

2.2 LADDER RACK SECTIONS AND COMPONENTS (where drawings indicate cable runway and/or ladder rack)

A. Manufacturer List:

1. Cooper B-line
2. Chatsworth – Universal Cable Runway System of Products
3. Hubbell
4. Or approved equal

B. Description:

1. Ladder rack shall be manufactured from 3/8" (9.5 mm) wide by 1-1/2" (38 mm) high tubular steel with .065" (1.65 mm) wall thickness.
2. Provided in widths indicated on the drawings.
3. Side stringers: 9'-11½" (3.0 m) long.
4. Welded cross members between stringers on 6" (300 mm) intervals/centers beginning 5-3/4" (146 mm) from one end.
5. Furnish manufacturer's standard clamps, hangers, brackets, splice plates, reducer plates, blind ends, barrier strips, connectors, and grounding straps.
6. UL Classified.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION BASKET TRAY

- A. Install wire basket tray in accordance with NEMA VE 2 to ensure that the cable tray equipment complies with the requirements of NEC, and applicable portions of NFPA70B and NECA's "Standard of Installation" pertaining to general electrical installations practices.



- B. Provide wire basket of types and sizes indicated; with connector assemblies, clamp assemblies, connector plates, splice plates and splice bars. Construct units with rounded edges and smooth surfaces; in compliance with applicable standards; and with the following additions construction features.
- C. All trays should be supported using a minimum of ¼" All Threaded Rod (ATR).
- D. Special accessories shall be furnished as required to protect, support and install a wire basket support system.
- E. Coordinate wire basket with other electrical work as necessary to properly interface installation of wire basket runway with other work.
- F. Support trays and fasten to structure and finishes in accordance with Section 27 05 29. Install supports at each connection point, at end of each run, and at other points to maintain spacing between supports of 6 ft (6'0") maximum.
- G. Install expansion connectors where recommended by manufacturer.
- H. Install firestopping in accordance with Section 07 84 00 to sustain ratings when passing cable tray through fire-rated elements.
- I. Ground and bond metal cable tray in accordance with Section 27 05 26.
- J. Provide continuity between tray components.
- K. Use anti-oxidant compound to prepare contact surfaces before assembly.
- L. Install two 6AWG bare copper equipment grounding conductor through entire length of tray; bond to each component.
- M. Make connections to tray using mechanical, compression or exothermic connectors.

3.3 INSTALLATION LADDER RACK

- A. Installation and configuration shall conform to the requirements of the ANSI/ EIA/TIA Standards 568A & 569, NFPA 70 (National Electrical Code), and applicable local codes.
- B. Runway should be supported every 4 feet on center with minimum 5/8 inch diameter threaded rod, or applicable support brackets or racks.
- C. Install metal cable tray in accordance with NEMA VE 2.
- D. Install fiberglass cable tray in accordance with NEMA FG 1.
- E. Support trays and fasten to structure and finishes in accordance with Section 27 05 29. Install supports at each connection point, at end of each run, and at other points to maintain spacing between supports of 4 feet maximum.



- F. Install expansion connectors.
- G. Install firestopping to sustain ratings when passing cable tray through fire-rated elements.
- H. Ground and bond metal cable tray in accordance with Section 27 05 26.

END OF SECTION 27 05 28.36

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 27 05 29 - HANGERS AND SUPPORTS FOR COMMUNICATIONS 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 RELATED SECTION

- A. 27 10 00 Structured Cabling

1.3 SUMMARY

- A. Provides specifications for non-continuous cable support components and woven fabric raceways utilized to provide pathways support to telecommunications cables traveling outside cable trays, conduits, or other continuous cable supports.
- B. Provides specifications for non-continuous cable support components and woven fabric raceways.
- C. References:
 - 1. Woven Innerduct: flexible raceway constructed from fabric or textile material placed inside a larger raceway (conduit).
 - 2. Cell: an individual subunit of a woven Innerduct assembly.
- D. Reference Material: Refer to the most recent version, update or addenda.
 - 1. ASTM B633 - Specification for Electro-Deposited Coatings of Zinc on Iron and Steel
 - 2. ASTM A653 - Specification for Steel Sheet, Zinc-Coated by the Hot-Dip Process
- E. Scheduling:
 - 1. Contract Documents and the overall construction schedule must be carefully reviewed to determine all required interfacing and timing of the work.

1.4 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.5 ACTION SUBMITTALS

- A. Product Data:
 - 1. Submit all product data in accordance with DDC General Conditions and Section 27 10 00.



2. Submit to the Commissioner product data and samples of anchoring device and narrative of installation procedure.
3. Submit (1) sample for each size and manufacturer of non-continuous cable support components utilized.

B. Shop Drawings:

1. Submit all shop drawings in accordance with DDC General Conditions and Section 27 10 00.

1.6 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Cable hooks shall be listed and labeled by Underwriters Laboratories (UL) and by UL to Canadian standards (cUL) as required.

PART 2 PRODUCTS

2.1 3 INCH 3 CELL WOOVEND FABRIC INNERDUCT

A. Specification:

1. Each innerduct assembly shall consist of (3) 3 inch cells constructed from white polyester and nylon resin polymer.
2. Each cell within an assembly shall have a unique color trace (stitching) for identification.
3. Each assembly (of 3 cells) within a conduit shall have a unique color trace (stitching) for identification.
4. All innerduct shall be rated for the environment that it is installed in.
5. Innerduct must be constructed so that the coefficient of friction does not exceed .08
6. Each cell will contain a color coded flat woven pulling tape rated for 1250lb of force and be UL2024A listed.
7. Pulling tape shall contain machine printed, sequential footage markings.

B. Contractor to provide 3inch 3 cell woven fabric innerduct to support cabling.

1. Maxcell
2. Wesco
3. Trench safe
4. Or approved equal

2.2 WOOVEND FABRIC FITTINGS

A. Specification:

1. Conduit Plugs: Compression-type conduit plugs with locking nuts for sealing and securing each textile innerduct within a conduit.
2. Termination Bags: Inflation-type bags for sealing and securing around each textile innerduct and cables within a conduit.



- B. Contractor to provide 3inch 3 cell woven fabric innerduct to support cabling.
 - 1. Maxcell
 - 2. Wesco
 - 3. Trench safe
 - 4. Or approved equal.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 NON-CONTINUOUS CABLE SUPPORT INSTALLATION

- A. Process:
 - 1. Follow manufacturer's recommendations for allowable fill capacity for each size of non-contiguous cable support.
 - 2. Use non-continuous support system shall be used in all locations where cables are not supported by approved raceways.
 - 3. Follow manufacturer's instructions and recommended industry standards and guidelines.
 - 4. Support for non-continuous support systems must be an independent support structure for the voice/data communication system.
 - 5. Draping cables over other structures in the ceiling is unacceptable. Water pipes, ceiling grid, sprinkler system, electrical supports, air ducts or any other in-ceiling structure may not be used for cable support.
 - 6. Contractor installed supports shall be used to supplement the main cable support system when any cabling leaves the main support system or is unsupported for more than three and one half feet (3.5'-0") feet.
 - 7. Non-continuous supports shall be installed threaded rod secured to the slab above to support the telecommunications cable infrastructure parallel to the slab throughout the cable plant, unless site conditions dictate a non-parallel installation.
 - 8. Cable must be routed to follow existing corridors and parallel or 90 degree angles from all walls and the cable tray whenever possible.
 - 9. Do not exceed the manufacturer's load capacity for the support device.
 - 10. Do not exceed the load capacity of the threaded rod or its anchoring device.
 - 11. Installation and configuration shall conform to the requirements of the ANSI/ EIA/TIA Standards 568 and 569, NFPA 70 (National Electrical Code).

3.3 INSTALLATION GENERAL - WOVEN INNERDUCT

- A. Process:
 - 1. Provide (3) 3-cell woven fabric innerducts for each 4 inch conduits that is 1) provided for communications cables and 2) is greater than 60 inches in length (sleeves do not receive innerduct).



2. Follow manufacturer's instructions for installing all innerducts.
3. Use swivels from same manufacture of woven fabric innerduct for installation of all innerduct.
4. Install innerducts that are rated for the environment that they are installed in.
5. Provide slack in the maintenance holes, hand holes, pull boxes, and at turns to ensure there is no kinking or binding of the innerduct.

END OF SECTION 27 05 29



SECTION 27 05 33 – CONDUIT & BACKBOXES FOR COMMUNICATION 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. Conduit, fittings and bodies, including multi-cell conduit
 2. Junction boxes, pull boxes and gutters
 3. Measured pull tape
- B. Related Requirements
1. Section 27 05 26 Grounding and Bonding for Communication Systems
 2. Section 27 15 13 Communications Copper Horizontal Cabling
 3. Section 27 15 43 Communications Faceplates and Connectors
 4. Section 27 05 53 Identification for Communication Systems

1.3 REFERENCES

- A. Abbreviation and Acronyms
1. AFF Above Finish Floor
 2. ANSI American National Standards Institute
 3. BICSI Building Industry Consulting Services International
 4. EMT Electric Metallic Tubing
 5. ENT Electrical Nonmetallic Tubing
 6. ID Inside Diameter
 7. ISO International Organization for Standardization
 8. NEC NEC Corporation of America
 9. NECA National Electrical Contractors Association
 10. NEMA National Electrical Manufacturers Association
 11. NFPA National Fire Protection Association
 12. NRTL Nationally Recognized Testing Laboratory
 13. OD Overall Diameter
 14. PVC Polyvinyl Chloride
 15. PMP Project Management Professional
 16. RCDD Registered Communications Distribution Designer
 17. RTPM Registered Telecommunications Project Manager
 18. TAA Trade Agreements Act



- 19. TDMM Telecommunications Distribution Methods Manual
- 20. TIA Telecommunications Industry Association
- 21. UL Underwriters Laboratory, an NRTL

B. Reference Standards

- 1. ANSI/NECA/BICSI 568-2006 – Standard for Installing Commercial Building Telecommunications Cabling
- 2. ANSI/TIA 568.1-D – Commercial Building Telecommunications Cabling Standard
- 3. BICSI Information Transport Systems Installation Methods Manual (ITSIMM) 7th Edition
- 4. BICSI Telecommunications Methods Manual (TDMM) 13th Edition
- 5. NECA 1-2015: Standard for Good Workmanship in Electrical Construction
- 6. NEMA VE 2 – Cable Tray Installation Guidelines, 2013
- 7. NFPA 70 - National Electrical Code.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Notification

- 1. Notify the Contract Administrator:
 - a. Where the document references sections that are unavailable
 - b. Where conflicts arise from requests in the documentation, implement the most onerous provision

1.5 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.**

1.6 ACTION SUBMITTALS

- A. Product Data:** Manufacturer’s technical literature for each product indicated, specified or required; include installation details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Samples:** Submit a sample for each component
- C. Special Procedure Submittals**
 - 1. Deliver-in-time installation strategy
- D. Qualification Statements**
 - 1. Project Manager
 - a. Possess a Registered Communications Distribution Designer qualification, be in good standing with BICSI, and has demonstrable experience managing similar projects in size and scope to this project.



1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For each product
- B. Warranty Documentation: For the system
- C. Record Documentation: Record drawings indicating the location of all the components and component identification

1.8 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.
- B. Regulatory Agency Sustainability Approvals
 - 1. Restriction of Hazardous Substances Directive compliant
- C. Qualifications
 - 1. Manufacturers
 - a. ISO 9001 – Quality Management Certification
 - b. ISO 14001 – Environmental Management Certification
 - c. ISO 27001 – Information Security Management Certification
 - 2. Suppliers
 - a. Manufacturer’s Approved Status
 - 3. Installers
 - a. Site supervisor:
 - 1) BICSI Technician (TECH)
 - b. Project Manager:
 - 1) Registered Communications Distribution Designer (RCDD)
 - 2) Project management certification:
 - a) Project Management Professional (PMP), or
 - b) Registered Telecommunications Project Manager (RTPM)

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Acceptance Requirements:
 - 1. Deliver in manufacturer’s original unopened and undamaged packages with manufacturer’s labels legible and intact
 - a. Except if removing packaging offsite to reduce waste as part of a documented deliver-in-time installation strategy.
 - 2. Inspect manufacturer’s packages upon receipt
- B. Storage and Handling Requirements: Protect from moisture, falls and compaction
- C. Packaging Waste Management: Recycle all materials



1.10 WARRANTY

A. Manufacturer Warranty

1. Warranty Period: One year from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 COMPONENTS – TWISTED PAIR BACK BOX

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Manufacturer List
 - a. Randl Industries, Inc., Legrand, Raco or approved equal.

B. Performance/Design Criteria

1. 127 mm x 127 mm x 72.5 mm (5 in. x 5 in. x 2.875 in.)
2. Side knockouts:
 - a. One 25 mm (1 in.) on each side
3. Back knockout:
 - a. One 13 mm (0.5 in.)
4. Integral cable management within the box
5. Galvanized steel

2.2 COMPONENTS – EXTENSION RING

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Manufacturer List
 - a. Randl Industries, Inc. Legrand, Raco or approved equal.

B. Performance/Design Criteria

1. 127 mm x 127 mm x 13 mm (5 in. x 5 in. x 0.5 in.)
2. Galvanized steel
3. Extension ring for twisted pair back box to allow presentation of standard 106-style face plate

2.3 SYSTEMS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Manufacturer List
 - a. Atkore International.
 - b. ABB Installation Products, Inc.
 - c. Condux International, Inc.
 - d. Eaton Corporation Plc.
 - e. Emerson Electric Co.
 - f. Fibertek Inc.



- g. Hubbell Incorporated.
- h. Triangle Wire and Cable, Inc.
- i. Zekelman Industries.
- j. Or approved equal.

B. Description

1. Regulatory Requirements

- a. As appropriate to the component:
 - 1) UL Listed for Standard for Electrical Intermediate Metal Conduit – Steel (UL 1242)
 - 2) UL Listed for Conduit, Tubing and Cable Fittings (UL 514B)
 - 3) UL Listed for Hardware for the Support of Conduit, Tubing and Cable (UL 2239)
 - 4) UL Listed for Electrical Rigid Metal Conduit – Steel (UL 6)
- b. Trade Agreements Act (TAA) Compliant

C. Types

- 1. Rigid Steel Conduit:
 - a. Atkore International, Triangle Wire and Cable, Inc. Zekelman Industries, or approved equal.
- 2. PVC-Coated Steel Conduit:
 - a. Rob-roy Industries, Inc. (Rob-Roy Red) or Occidental Coating Company (O-Cal Blue), ABB (Thomas and Betts), or approved equal.
- 3. PVC Rigid Conduit:
 - a. Carlon, Rob-roy Industries, Inc. or Cantex, ABB (Thomas and Betts), or approved equal. or approved equal.
- 4. Multi-Cell Raceway Electrical Metallic Tubing (EMT) Conduit:
 - a. Carlon Multi-Gard Multi-Cell Raceway EMT, prime Conduit or Multi-Gard or submitted and Commissioner-approved equal.
- 5. Multi-Cell Raceway Galvanized Steel Conduit:
 - a. Carlon Multi-Gard Multi-Cell Raceway Galvanized Steel, Prime Conduit, Multi-Gard or submitted and Commissioner-approved equal.
- 6. Conduit Fittings and Bodies:
 - a. Crouse-Hinds, Appleton Electric, Killark Electric Manufacturing Company or O-Z/Gedney, or approved equal.
- 7. Measured pull tape – pull tape printed with sequential footage markings for accurate measurements:
 - a. Fibertek, Condux International, Neptco, or approved equal.

D. Requirements

- 1. Fabricate conduit, fittings, and bodies to form a continuous support system for communications cables.
- 2. PVC-Coated Rigid Steel Conduit and Fittings: Follow NEMA RN1 (Type A).
- 3. Rigid Steel Galvanized Conduit and Fittings Before Coating:
 - a. Follow FS WW-C-581d, ANSI C80.1, and UL 6.
 - b. Pass bending, ductility, and thickness of zinc coating in ANSI C80.1.
- 4. Nonmetallic Conduit and Fittings: Pass NEMA TC2, UL 651 and 651A and FS W-C-1094A. EMT fittings shall be formed steel compression ring type. Die cast fittings are not allowed.



5. All conduits, fittings, junction and pull boxes shall be UL Listed.
6. All conduits, fittings, junction and pull boxes shall comply with the NEC.
7. Conduit Bodies: Follow UL 514B and FS W-C-58C. Furnish sufficient coating for touch up after installation.
8. Conduit Fittings
 - a. All fittings shall be compression or threaded.
 - b. Fittings shall provide a secure connection for pulling communications cables.
 - c. Setscrew fittings are not permitted.
9. Conduit "condulets" are not permitted.
10. Non-metallic conduits are not permitted in above-ground installations. Conversion fittings are required for non-metallic (below ground) to metallic (above-ground) transitions.
11. Measured pull tape
 - a. Shall be pre-lubricated, woven polyester, low friction, and high abrasion resistant yarn.
 - b. Minimum average tensile strength shall be 54.43 kgs (1130 lbs.) for 38.1 mm (1.5 in.) and smaller conduits and innerduct.
 - c. Minimum average tensile strength shall be 816.46 mm (1800 lbs.) for conduits larger than 38.1 mm (1.5 in.).
12. Junction boxes, gutters, pull boxes
 - a. All junction boxes, gutters and pull boxes shall comply with NEC Article 314.
 - b. All junction boxes, gutters and pull boxes shall meet the following minimum material requirements:
 - 1) 16-gauge steel or larger.
 - 2) Seams shall be continuously welded and grounded smooth.
 - 3) Continuous hinge (where possible).
 - 4) External screws and clamps.
 - 5) External mounting feet (where possible).
 - 6) Oil-resistant gasket and adhesive.
 - 7) ANSI 61 gray polyester powder coating inside and out over phosphatized surface.
 - 8) UL 50 type 12.
 - c. All junction boxes, gutters and pull boxes shall be provided with the following:
 - 1) Proper knockouts for the required number of conduits.
 - 2) Shall be provided with proper bushings for conduits and/or cabling.
 - 3) Shall have a securely installed hinged access cover.
 - d. All junction boxes, gutters and pull boxes shall be securely installed.
 - e. All junction and pull box sizes for single and multiple conduit runs shall comply with BICSI TDMM.
 - f. Gutter sizes for single conduit runs shall comply with BICSI TDMM.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.



3.2 EXAMINATION

A. Verification of Conditions

1. Check actual site conditions before starting any Work
2. Ensure all preceding Work associated with the telecommunications system is accurate and complete before proceeding with the installation or use of products specified in this section

3.3 PREPARATION

A. Surface Preparation

1. Verify conduit system is properly sized for cables (minimum one inch).
2. Verify general conduit route
3. Verify substrates to which work is connected and determine detail requirements for proper support.
4. Verify proper location and type of rough-in for conduit terminations.

3.4 INSTALLATION

A. Install as per:

1. The manufacturer's recommended installation instructions
2. ANSI/NECA/BICSI 568-2006
3. BICSI ITSIMM
4. NECA-1
5. NFPA 70

B. Locations and Types:

1. Install PVC-coated conduits in outdoor above-ground locations, inside valve vaults and wet wells, and in corrosive and wet environments.
2. Install PVC conduits in buried duct banks or encased in concrete. Use PVC-coated rigid steel elbows for stubouts.
3. Install exposed conduit parallel or perpendicular to lines of existing construction and grouped together where possible, without interfering with use of premises or working areas. Prevent safety hazards and interference with operating and maintenance procedures.
4. Conduit may pass through areas with temperature differential of 20 degrees F or more. Seal with proper fitting at barrier between areas of differing temperature.
5. Do not install conduit in interference with equipment placement or operation; piping; structural members; maintenance access; indicated future equipment.
6. Contractor's RCDD supervisor shall coordinate with Drawings of other disciplines to determine availability of space for installation.

C. Conduit Sizing, Arrangement and Support:

1. Conduit fill shall comply with TIA-569-C.
2. Group conduit in parallel runs where practical and use conduit rack constructed of steel channel with conduit straps or clamps. Provide space for thirty percent additional conduits whenever possible.
3. Support un-encased conduit with clamps, hangers, straps and metal framing channel attached to building structure.



4. Arrange conduit supports to prevent alignment distortion by wire pulling operations. Fasten conduits using galvanized straps, lay-in adjustable hangers, clevis hangers, or bolted split stamped galvanized hangers.
5. For conditions where existing supports are insufficient, install rigid support system, securely attached to building structural members only, plumb, level and in true alignment with related and adjoining work.
6. Support conduit 50.8 mm (2 in.) and larger at 3.05 m (10 ft.) on center maximum, and conduit 38.1 mm (1.5 in.) and smaller at 2.43 m (8 ft.) on center maximum.
7. Fasten 38.1 mm (1.5 in.) and smaller conduit to concrete, masonry or steel with either one-hole malleable iron conduit straps, or "Korn" clamps, or U-bolts; for larger diameters, use two-hole straps. Use "clamp backs" for strapping conduits to planar surfaces.
8. Provide PVC-coated or stainless steel supports for PVC-coated conduit.
9. Do not fasten conduit with wire or perforated pipe straps. Remove all wire used for temporary conduit support during construction, before conductors are pulled.
10. Allow minimum 6.35 mm (0.25 in.) clearance from vertical surfaces to prevent dirt and moisture buildup behind conduit.

D. Design Considerations:

1. Contractor's RCDD supervisor shall coordinate material changes to design with the Commissioner.
2. Fabricate bends free of indentations or elliptical sections.
3. The minimum bend radius is six times the conduit ID for a 50.8 mm (2 in.) conduit or less.
4. The minimum bend radius is ten times the conduit ID for a conduit greater than 2 inches.
5. The minimum bend radius is eight times the conduit ID for a conduit supporting the TBB for a 50.8 mm (2 in.) conduit or less.
6. Below grade conduit shall extend four inches AFF with a bushing.
7. Ceiling conduit or sleeves shall extend four inches below finished ceiling with a bushing.
8. All stubbed conduit ends shall be provided with a ground bushing.
9. All conduit penetrations shall be provided with the proper conduit sleeves.
 - a. Sleeves shall extend three inches AFF or four inches below finished ceiling, with a bushing.
 - b. Sleeves shall be installed in the communications room floor or ceiling a minimum of 50.8 mm (2 in.) to 101.6 mm (4 in.) on center from the wall.
 - c. Conduit floor sleeves shall be spaced in increments to equal the conduit outside diameter from each other.
 - d. Shall be installed in a single tier or row from left to right horizontally.
 - 1) If two tiers or rows are required the conduits shall be staggered between tiers.
 - 2) No more than two tiers or rows are permitted.
10. Cable support anchors shall be installed 457.2 mm (18 in.) to 609.6 mm (24 in.) above the sleeves.
 - a. All conduit penetrations shall comply with all applicable fire codes. All conduit penetrations in fire-rated walls or floors shall be sealed and fire proofed to at least the rating of the penetration area.
 - b. Conduits shall be routed in the most direct route, with the fewest number of bends possible.
 - c. There shall be no continuous conduit sections longer than 30.48 m (100 ft.). For runs that total more than 30.48 m (100 ft.), insert junction or pull boxes (or gutters if



- appropriate) so that no continuous run between pull boxes is greater than 30.48 m (100 ft.)
- d. There shall be no more than two 90-degree bends (180 degrees total) between conduit pull boxes.
 - e. Terminate conduit in sheet metal enclosures. Outdoor enclosures shall be furnished with threaded hubs. Side penetrations in the enclosure are not permitted.
 - f. Changes in direction shall be accomplished with sweeping bends observing minimum bend radius requirements above. Do not use pull boxes for direction changes unless specifically designated otherwise in the Drawings.
 - g. Unless otherwise noted in the Drawings, conduits entering pull boxes shall be aligned with exiting conduits.
 - h. Pull boxes shall be placed in readily accessible locations at a height to clear the ceiling grid with box door open.
- E. Separation requirements – following are the minimum separation requirements between communications and power cables.
1. Unshielded power lines or electrical equipment in proximity to open or non-metal pathways:
 - a. Less than 2 kVA – 127 mm (5 in.)
 - b. 2 to 5 kVA – 304.8 mm (12 in.)
 - c. Greater than 5 kVA – 609.6 mm (24 in.)
 2. Unshielded power lines or electrical equipment in proximity to grounded metal conduit pathway:
 - a. Less than 2 kVA – 63.5 mm (2.5 in.)
 - b. 2 to 5 kVA – 152.4 mm (6 in.)
 - c. Greater than 5 kVA – 304.8 mm (12 in.)
 3. Power lines enclosed in a grounded metal conduit (or equivalent shielding) in proximity to a grounded metal conduit pathway:
 - a. 2 to 5 kVA – 76.2 mm (3 in.)
 - b. Greater than 5 kVA – 152.4 mm (6 in.)
- F. Installation:
1. Install conduit mechanically secure, mechanically protected from physical harm, electrically continuous, and neat in appearance. Ensure interior of conduit is clean and smooth to permit pulling conductors without damage to insulation. Wrench-tighten threaded connections.
 2. Cut conduit ends square, leaving a flat conduit face. Do not use plumbing pipe cutters.
 3. Deburr ends.
 4. Cut threads with standard conduit dies providing 19.05 mm (0.75 in.) taper per foot and of proper length to make joints and terminals tight and without deformation.
 5. Use thread cutting oil continuously during threading. Remove metal cuttings and oil after cutting and before painting (if any).
 6. Use non-corrosive, coal tar enamel or zinc rich epoxy primer on threads of steel conduit before connection.
 7. Use only strap wrenches to tighten joints in plastic coated rigid steel conduit. Replace conduit and fittings showing cuts, nicks and threader chuck jaw marks and other damage. Use solvent, or the same patching material, to seal around edges of conduit fitting covers.



8. Protect conduit terminations from mechanical damage, and prevent entry of moisture, dirt and foreign matter into the conduit system by properly capping terminations.
9. Fit conduit crossing structure expansion joints with approved expansion fittings and bonding jumpers.
10. Seal annular space at conduit penetrations through structures and pavement airtight and watertight.
11. Provide measured pull tape in all conduits and innerduct prior to cable installation. Measured pull tape shall be replaced with standard pull tape (non-measured) when each cable is installed.

G. Horizontal Conduit Routes

1. Horizontal Conduits
 - a. Horizontal (station) conduit is defined as the conduit run between the communications outlet and the cable tray or communications room as indicated on Drawings.
 - b. Each horizontal conduit run shall be a 25.4 mm (1 in.) metallic conduit and shall be home run from each communications outlet box to the equipment room, terminating equipment or cable tray, as indicated in Drawings.
 - c. Each route shall be installed with the least amount of conduit bends.
 - d. Each single horizontal conduit run shall be provided with a junction or pull box every 30.48 m (100 ft.).
 - e. Each dual horizontal conduit run shall be provided with a junction or pull box every 30.48 m (100 ft.). The quantity of conduits entering the junction or pull box shall equal the number of conduits exiting the junction or pull box.
 - f. Each terminating (outlet end) conduit connection shall be provided with the proper connecting bushing fitting.
 - g. Each originating end (communications room end) shall be provided with the proper connecting ground bushing fitting and properly bonded to ground.
2. Horizontal Junction/Outlet Boxes
 - a. Each horizontal conduit shall be terminated into an outlet box.
 - b. Each outlet box shall be a deep 101.6 mm (4 in.) square by 63.5 mm (2.5 in.) deep junction box with a minimum of two 25.4 mm (1 in.) knockouts on top, bottom and each of the sides.
 - c. Each conduit home run shall be provided with a deep 101.6 mm (4 in.) junction box (w/cover) at 30.48 m (100 ft.) intervals and 152.4 mm (6 in.) above each ceiling and wall intersection.
3. Horizontal conduit entrance in communications rooms – wall entry
 - a. Horizontal conduits shall enter the communications room wall 304.8 mm (12 in.) to 457.2 mm (18 in.) above the top of the cable tray.
 - b. Conduit wall stubs shall be spaced in increments equal to the conduit OD from each other.
 - c. All conduit wall stubs shall be extended to the terminating equipment, electronics, or cable tray, as noted in Drawings.
 - d. Conduit crossovers are not permitted.
4. Horizontal conduit entrance in communications rooms – ceiling entry
 - a. Horizontal conduits shall enter or be extended from the equipment room ceiling 304.8 mm (12 in.) to 457.2 mm (18 in.) above the top of the cable tray.



- b. Ceiling conduit stubs shall be spaced in increments equal to the conduit OD from each other.
 - c. All ceiling conduit stubs shall be extended to the terminating equipment, electronics, or cable tray, as noted in Drawings.
 - d. Conduit crossovers are not permitted.
- 5. Horizontal conduit entrance in communications rooms – floor entry
 - a. Horizontal conduits shall enter the communications room floor two inches to four inches on center from the wall and shall be stubbed 152.4 mm (6 in.) AFF.
 - b. Conduit floor stubs shall be spaced in increments equal to the conduit OD from each other.
 - c. All conduit floor stubs shall be extended to the terminating equipment, electronics, or cable tray, as noted in Drawings, by routing up the wall, between the wall and the wall-mounted cable tray side rail, and extending 304.8 mm (12 in.) to 457.2 mm (18 in.) above the top of the cable tray.
 - d. Conduit crossovers are not permitted.
- 6. Horizontal conduit-to-cable tray
 - a. Only the terminating end of horizontal communication conduits shall be attached to the cable tray.
 - b. Non-communications conduit shall not be attached to the cable tray in any fashion.
 - c. Conduit terminating end shall be attached to cable tray side rail with “conduit-to-cable tray” clamps. No other form of attachment shall be permitted.
 - d. Top or bottom cable tray conduit feeds and attachments are not permitted.
- 7. Riser Conduit Routes
 - a. Riser conduit entrance in communications rooms – wall entry
 - 1) Riser conduits shall enter the communications room wall a minimum of 609.6 mm (24 in.) above the top of the cable tray.
 - 2) Conduit wall stubs shall be spaced in increments to equal the conduit OD from each other.
 - 3) Riser conduits shall be installed in a single tier or row from left to right horizontally.
 - a) If two tiers or rows are required the conduits shall be staggered between tiers.
 - b) No more than two tiers or rows are permitted.
 - b. All conduit wall stubs shall be extended to and over the cable tray to access cable tray pathway.
 - c. All riser conduit stubs shall be provided with the proper universal drop-out/ waterfall cable exit runway, which shall be supported by and mounted to channel strut.
 - d. Conduit crossovers are not permitted.
 - e. Riser conduit entrance in communications rooms – floor entry
 - 1) Riser conduits shall enter the communications room floor 50.8 mm (2 in.) to 101.6 mm (4 in.) on center from the wall and shall stub up 152.4 mm (6 in.) AFF.
 - 2) Conduit floor stubs shall be spaced in increments to equal the conduit OD from each other.
 - 3) Riser conduits shall be installed in a single tier or row from left to right horizontally.
 - a) If two tiers or rows are required the conduits shall be staggered between tiers.



- b) No more than two tiers or rows are permitted.
 - 8. Exiting cable shall be extended to the bottom of the cable tray and be provided with cable support anchors and secured with supporting hardware every 152.4 mm (6 in.) above the conduit bushings.
 - 9. Conduit floor stubs shall be extended to the terminating equipment, electronics, or cable tray, only when noted in Drawings. When required conduits shall be routed up the wall, between the wall and the wall-mounted cable tray side rail and extended 304.8 mm (12 in.) to 457.2 mm (18 in.) above the top of the cable tray.
 - 10. The riser cable shall be extended in the cable tray to the terminating equipment, as noted in the Drawings.
 - 11. Conduit crossovers are not permitted.
 - 12. All metallic conduits shall be grounded to the telecommunications ground bus bar at each end.
- H. Multi-Cell Raceway
- 1. All multi-cell galvanized steel entry conduit stubs shall be transitioned to multi-cell EMT egress conduit.
 - 2. All multi-cell galvanized steel conduit room stubs shall be transitioned to multi-cell EMT conduit using the proper metallic connecting fittings.
 - 3. Within the communications rooms, only non-metallic Riser Gard innerduct shall be extended from the conduit stub to the terminating equipment.
 - 4. Manufacturer's non-metallic connecting fitting shall be used at all connections.

3.5 REINSTALLATION

- A. No additional burden to the Commissioner regarding costs, network downtime, or end-user interruption shall result from the reinstallation of specified components.
- B. Coordinate any reinstallation work, in writing, with the Commissioner.

3.6 CLEANING

- A. Clean as recommended by Manufacturer. Do not use materials or methods which may damage the surface or surrounding construction.
- B. Waste Management: Recycle all detritus.

3.7 PROTECTION

- A. Protect the system from subsequent construction operations and use contrary to its primary purpose

END OF SECTION 27 05 33

SECTION 27 05 53 - IDENTIFICATION FOR COMMUNICATIONS 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 RELATED SECTION

- A. 27 10 00 Structured Cabling

1.3 SUMMARY

- A. Identification of the various components of the telecommunications infrastructure and pathway system.
- B. Section Includes:
 - 1. Labeling and identification
- C. Reference Material: Refer to the most recent version, update or addenda.
 - 1. TIA-568-C.1: Commercial Building Telecommunications Cabling Standard, Edition C, Publish Date 05/03/2012.
 - 2. TIA-758: Administration Standard for Commercial Telecommunication Infrastructure, Published 2004.

1.4 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.5 ACTION SUBMITTALS

- A. Product Data:
 - 1. Submit all product data in accordance with DDC General Conditions and Section 27 10 00.
- B. As-Built Drawings:
 - 1. Submit all as-built drawings in accordance with the requirements of Section 27 10 00.
 - 2. Provide floorplan drawings showing outlet identification numbering in hard copy and AutoCAD format.



3. Provide equipment elevation drawings of all racks, cabinets, and wall field locations showing termination identification numbering in hard copy and AutoCAD format.

C. Closeout Submittals

D. As-Built Drawings

1. Submit all as-built drawings in accordance with the requirements of Section 27 10 00.
2. Final project labeling scheme documentation clearly indicating the City of New York approved labeling scheme for all components of the communications system.

1.6 QUALITY ASSURANCE

A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Qualifications – Manufacturer:

1. Component manufacturer shall be ISO 9001:2000 and offer products that are RoHS compliant.

PART 2 PRODUCTS

2.1 LABELING AND IDENTIFICATION

A. Manufacturer List:

1. Panduit thermal transfer printer.
2. Brady labeling system
3. Staples Label maker
4. Or approved equal

C. Product Options:

1. The indicated manufacturers shall be the basis of the design and each component selected shall address the requirements for each situation.

D. Description:

1. All labels shall be machine-manufactured by a labeling machine. Handwritten labels will not be accepted for final labeling.
2. The intention of the labeling scheme is to be TIA- 606 compliant.
3. It is the responsibility of the contractor to acquire, understand, and utilize the City of New York labeling scheme for all components of the voice data communications system.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

- A. Check actual site conditions prior to start of any work. Ensure all preceding trade work associated with the telecommunications system is accurate and complete before proceeding with installation or use of products specified in this section.

3.3 CABLE (SHEATH) ID

- A. Provide machine printed label directly to cable sheath, a minimum 3" from each end of cable sheath.
- B. Cable identification numbers shall include a unique identifier indicating cable type and a sequential number.
- C. Every cable identification number must be unique.
- E. Telecommunications outlets:
 - 1. Provide machine printed label on each telecommunication outlet indicating outlet identification number.
 - 2. Use labeling product from faceplate manufacturer if available, including plastic window to protect label.
 - 3. If individual jack labels (1,2,3... or A, B, C... etc.) are not part of the molded construction of the outlet faceplate provide machine printed labels adjacent to jack installed in the faceplate.
- F. Termination hardware:
 - 1. Label termination hardware using numbering identification scheme compliant with TIA-606: Administration Standard for Telecommunications Infrastructure, Edition B, Publish Date 06/22/2012
 - 2. Install labels following connecting hardware manufacturers' instructions.
 - 3. When labeling instructions are not provided by connecting hardware manufacturer, install labeling using the following guidelines:
 - a) Install where it will be most visible by cabling or network technician standing in front of the hardware.
 - b) Where it is best illuminated by overhead lighting.
 - c) Least likely to be obstructed by patch cordage.
 - d) Where it is not obstructed by hinged or removable connecting hardware cover.
- G. Rack labeling:
 - 1. Label all racks shown on drawings with engraved plastic label
 - 2. Label top of equipment racks, front and back
 - 3. Label side of rack when it is the first or last in a bay of 2 or more and does not directly abut a wall.
- H. Cabinet labeling.
 - 1. Label all cabinets shown on drawings with engraved plastic labels.



2. Turnover to City of New York labels for cabinets not purchased under this contract for installation by others.
3. Label top of cabinets, front and back.
4. Label side of cabinet when it is the first or last in a bay of 2 or more and does not directly abut a wall. Install cabinet side labels at top of cabinet.
5. Do not apply label to removable cabinet doors or side panels
6. Label side of cabinet when it is the first or last in a bay of 2 or more and does not directly about a wall.

3.4 RE-INSTALLATION

- A. No additional burden to the City of New York regarding costs, network down-time and/or end user interruption shall result from the re-installation of specified components. Scheduling for re-installation work shall be coordinated, in writing, with the City of New York prior to beginning the work.

3.5 CLOSEOUT ACTIVITIES

- A. Contractor shall provide documentation of all telecommunications system components under this section utilized throughout the site for review and reference by the Commissioner.
- B. Contractor to submit all as-built drawings required prior to acceptance by the City of New York.

END OF SECTION 27 05 53

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 RELATED SECTIONS

- 1. 27 05 26 Grounding and Bonding for Communications Systems
- 2. 27 05 33 Conduit and Backboxes for Communications Systems
- 3. 27 05 28.36 Cable Trays for Communications Systems
- 4. 27 05 29 Hangers and Supports for Communications Systems
- 5. 27 05 53 Identification for Communications Systems
- 6. 27 11 16 Communications Cabinets, Racks, Frames and Enclosures
- 7. 27 11 19 Communications Termination Blocks and Patch Panels
- 8. 27 11 23 Communications Cable Management and Ladder Rack
- 9. 27 11 26 Communications Rack Mounted Power Protection and Power Strips
- 10. 27 13 13 Communications Copper Backbone Cabling
- 11. 27 13 23 Communications Optical Fiber Backbone Cabling
- 12. 27 15 13 Communications Copper Horizontal Cabling
- 13. 27 15 43 Communications Faceplates and Connectors

1.3 SUMMARY

- A. General requirements for Communications work.
- B. Related Work Not Included In Under Sections 271000 But Specified Elsewhere:
 - 1. Refer to Fire and Smoke Protection
 - 2. Refer to Painting and Coating

1.4 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.5 SUBMITTALS

- A. Within two (2) days after date of execution of contract documents, submit for review and acceptance a list of all material and equipment manufacturers whose products are proposed. Only specified suppliers shall appear on the submittal list. The complete submittal list must be reviewed and accepted prior to submittal of shop drawings. No shop drawings will be processed



without an accepted submittal list. Data of a general nature will not be accepted. The materials and equipment submittals will include:

1. All material, systems and equipment as listed herein:
 - a. Mark each copy of the product data sheets to show applicable choices and options.
 - b. Where product data includes information on several products, some of which are not required, mark copies to indicate the applicable information.
 - c. Submit manufacturer's product data sheets for all fire stopping materials proposed for use on the project.
- B. Installation of telecommunications systems shall be performed under the direct supervision of a trained specialist, authorized by the manufacturer.
- C. Labor force shall properly trained by the manufacturer and shall provide copies of certifications for all technicians who are expected to install the system and execute the tests. Amend this submission at time of actual installation with updated data on all technicians actually assigned. Submit for review and acceptance the following information for each technician:
 1. Optical Fiber Terminator: Certifications for instruction on the approved manufacturers' connectors and in the splicing methodologies.
 2. UTP Cable Testers: Certifications for use of Level III UTP cable testers to be used on the project.
 3. Optical Fiber Cable Testers: Certifications for use of optical loss power meters and OTDR testing equipment to be used on the project.
- D. Product data submittals:
 1. In addition to the specific requirements of the individual division 27 sections, at a minimum, product data submittals shall include the following:
 - a. Manufacturer's cut-sheets and/or specification sheet for all products installed under division 27.
 - b. Each product data submittal shall include the individual product identified by a check mark. Product data submittals that do not have specific products indicated will be returned without review.
 - c. Each product data submittal shall include the applicable specification section. Product data submittals that do not include the applicable specification section shall be returned without review.
- E. Other information submittals:
 1. In addition to the specific requirements of the individual division 27 sections, at a minimum, shop drawings shall include the following:
 - a. Cable termination/pull schedules for each horizontal and riser cable segment that includes at a minimum:
 - i) Floor number
 - ii) Room number
 - iii) Work area outlet ID
 - iv) Work area port number/letter
 - v) IDF Room name/number



- vi) Rack number
- vii) Patch panel RU position
- viii) Patch Panel Port number

F. Shop Drawings:

1. All drawings shall be submitted 2 weeks in advance of field requirements to allow ample time for review and resubmitted as may be required. All submittals shall be complete and contain all required and detailed information.
2. Shop drawings shall consist of two (2) sets of prints of drawings, diagrams, schedules, and other data specially prepared for the work by the contractor or any subcontractor, manufacturer, supplier or distributor to illustrate some portion of the work as required.
3. The contractor shall submit three (3) copies of the floor plan, with station information outlets numbered, at the start of construction.
4. Acceptance of any submitted data or shop drawings for material, equipment apparatus, devices, arrangement, and layout shall not relieve the contractor from responsibility of furnishing same of proper dimensions and weight, capacities, sizes, quantity, quality, and installation details to perform efficiently the requirements and intent of the contract. Such acceptance shall not relieve contractor from responsibility for errors, omissions, or inadequacies of any sort on submitted data or shop drawings.
5. Each shop drawing shall contain job title and reference to the applicable drawing and specification article.
6. Individual shop drawing submittals shall be provided for each specific material, system or equipment as identified herein. Submittals provided other than in this manner will be returned without review.
7. In addition to the specific requirements of the individual division 27 sections, at a minimum, shop drawings shall include the following:
 - a. Schematic diagrams indicating type and quantities of riser and tie cabling.
 - b. Plan drawings of each floor indicating cable pathways, outlet locations, and each outlet ID.
 - c. IDF room equipment plans indicating dimensioned locations of division 27 equipment.
 - d. IDF room reflected ceiling plans indicating dimensioned locations of division 27 equipment.
 - e. IDF room elevations where div 27 work exists on walls indicating dimensioned locations of division 27 equipment.
 - f. Elevation drawings depicting each rack and division 27 equipment.

1.6 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. All materials furnished shall be new, unused, clean and free from damage, defects or corrosion.
- C. Equipment and materials of the same type shall be a product of the same manufacturer throughout unless specifically exempted in advance.
- D. The Contractor, upon receiving notice from the City of New York that the Contractor has furnished inferior, improper or unsound Work or materials (including equipment, whether operational or unused) or Work or materials at variance with that which is specified will, within twenty-four (24) hours, proceed to remove such Work or materials and make good all other Work or materials damaged thereby, and, at the option of City of New York, the Contractor shall immediately replace such Work or materials with Work or materials as specified. The removal, replacement and repair shall be performed at such times and with manpower sufficient, in the judgment of City of New York, so as to avoid disturbance to occupants, or other ongoing work.
- E. If the Contractor does not remove such unsound Work within a reasonable time, the City of New York may remove it and may store the material at the expense of the Contractor. If the Contractor does not pay the expenses of such removal within ten (10) days time thereafter, the City of New York may, upon ten (10) days written notice, sell such materials and account for the net proceeds after deducting all the costs and expenses that should have been borne by the Contractor and all expenses of the sale.
- F. The City of New York shall have full authority at all times, until Final Completion and acceptance of the Work, to inspect and reject Work and materials which in its judgment are not in conformity with the Drawings and Specifications.

1.7 PROJECT DESCRIPTION

- A. This project consists of the installation of a structured cabling system for the construction of a new headquarters building and parking garage. The structured cabling system shall include and MDF/IDF environment and outside plant cabling system.

1.8 WORK INCLUDED

- A. It is the intent of these Specifications to create an TIA-568-C compliant cabling system to support high-speed data applications up to and in excess of 1000 Mbps including IEEE standards based on Fast Ethernet, Gigabit Ethernet, 10 Gigabit Ethernet, and ATM. System acceptance shall be judged on its ability to perform as such, the successful adherence to the installation instructions of this Specification, and compliance with parts and workmanship warranties.

- B. The work covered by this specification includes the installation of a complete cabling system, including all labor necessary to perform and complete such installation, all materials and equipment incorporated or to be incorporated in such installation, and all services, supervision, consumable items, fees, licenses, facilities, tools, and equipment necessary or used to perform and complete such installation.
- C. The Work Included is defined by the following and further defined in the drawings and Sections of Division 27 10 00:
 - 1. Provide project management and oversight for the installation of a complete structured cabling system.
 - 2. Prepare and submit component documentation shop drawings, cable termination schedules, cable test results and as-built drawings as described within this Specification and per General Condition.
- D. Preparation of shop drawings, record or as-built drawings, manufacturer cut sheets, and other documentation described herein.

1.9 DEFINITIONS

- A. (NEC) National Electrical Code.
- B. (OSHA) Occupational Safety & Health Administration.
- C. (ANSI) American National Standards Institute.
- D. (NFPA) National Fire Protection Association
- E. (ASA) American Standards Association
- F. (NEMA) National Electrical Manufacturers Association
- G. (UL) Underwriters' Laboratories, Inc
- H. (IES) Illuminating Engineering Society
- I. (IPCEA) International Power Cable Engineers Association
- J. (ASTM) American Society of Testing Materials
- K. (ETL) Electrical Testing Laboratories, Inc
- L. (TIA) Telecommunication Industries Association
- M. (FCC) Federal Communications Commission
- N. (FM) Factory Mutual
- O. "PERMANENT LINK" means the end-to-end test configuration for a link excluding test cords and patch cords, but including the mated connection with the link.
- P. "WIRING" or "CABLING" includes furnishing, unless otherwise noted, of all fittings, hangers, supports, sleeves, etc.
- Q. "CONDUIT" and CABLE TRAY" includes furnishing, unless otherwise noted, of all fittings, hangers, supports, sleeves, etc.

- R. "CONCEALED" means embedded in masonry or other construction, installed behind wall furring or within double partitions, or installed within hung ceilings.
- S. "EXPOSED" means not installed underground or "CONCEALED" as defined above.

1.10 CODES, REGULATIONS, AND STANDARDS

- A. All equipment shall be equal to or exceed the minimum requirements of OSHA, NEMA, SAME, ASME, ANSI, NEC and Underwriters' Laboratories.
- B. The installation shall comply fully with product manufacturers recommendations for installation.
- C. Should any change in plans or specifications be required to comply with governmental regulations, the contractor shall notify the Commissioner at the time of submitting the construction schedule
- D. All products, services and materials provided and performed under the scope of this specification shall conform to the following codes and standards:
 - 1. ANSI X3T9.5 FDDI
 - 2. ANSI X3T9.5 CDDI
 - 3. Building Industry Consulting Service International (BICSI) Telecommunications Distribution Methods Manual - latest edition.
 - 4. TIA-568-C.1: Commercial Building Telecommunications Cabling Standard, Edition C, Publish Date 05/03/2012.
 - 5. TIA-569: Telecommunications Pathways And Spaces, Edition C, Publish Date 05/03/2012
 - 6. TIA-606: Administration Standard For Telecommunications Infrastructure, Edition B, Publish Date 06/22/2012
 - 7. TIA-607: Generic Telecommunications Bonding And Grounding (Earthing) For Customer Premises, Edition B, Publish Date 08/26/2011
 - 8. EIA RS-232 Serial Communications Electrical Interface
 - 9. EIA RS-310-C Racks, Panels and Associated Equipment
 - 10. FCC Part 15
 - 11. FCC Part 68
 - 12. NFPA 70 National Electrical Code

1.11 COORDINATION OF WORK

- A. Carefully check space requirements and the physical confines of the areas of work to ensure that all material can be installed in the spaces allotted thereto, including TER, TR, and TSER rooms, riser space and sleeves, raceways, conduits, and cable supports.
- B. Transmit to the Commissioner, with 2 days notice, all information necessary for any work required by other trades and/or equipment vendors to ensure that all trades/vendors have the information necessary to properly install all the necessary connections and equipment. Also

with 1 day notice, identify all items of work that require access so that the Commissioner may arrange for such access.

- C. The contractor shall arrange and coordinate all access to the job site and to the floors as well as the receipt, staging, marshaling, and safe storage of all materials, tools and supplies with the Commissioner.
- D. Provide notification immediately if the work of another trade appears to be behind schedule and could delay your work. Provide documentation that the appropriate party was notified of the impending problem within a reasonable amount of time.
- E. Contractor will attend all construction meetings, at the project site or other location, as requested.
- F. Without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or for proper compliance with the contract documents.
- G. Cleanup and removal of debris is the responsibility of the contractor.

1.12 DELIVERY, STORAGE, AND HANDLING

- A. Ship all products and materials in a manner that will protect them from damage, weather, and entry of debris. If items are damaged, do not install, but take immediate steps to obtain replacement.
- B. Deliver materials (except bulk materials) in manufacturer's unopened container, fully identified with the manufacturer's name, trade name, type, class, grade, size and color.
- C. Store materials suitably sheltered from the elements, but readily accessible for inspection until installed. Store all items subject to moisture damage in dry spaces. Identify space requirements for storage with the submittals.
- D. Costs of all shipping to the site and all unusual storage requirements shall be borne by the Contractor. It shall be the responsibility of the Contractor to make appropriate arrangements and to coordinate with authorized personnel at the site for the proper acceptance, handling, protection and storage of equipment so delivered.
- E. Movement of material, either at the time of delivery or subsequently, shall be the sole responsibility of the Contractor. All costs associated with this movement shall also be the responsibility of the Contractor.

- F. Movement of material, either at the time of delivery or subsequently, shall be the sole responsibility of the Contractor. All costs associated with this movement shall also be the responsibility of the Contractor.
- G. The Contractor shall be responsible for the safe storage of all equipment. In the event of equipment damage or disappearance from the site, the Contractor shall bear full responsibility and all costs associated with equipment replacement at no additional cost to City of New York.
- H. The contractor shall maintain and protect all equipment, materials, and tools from loss or damage from all causes until final acceptance by City of New York.

1.13 PROJECT CLOSEOUT

- A. Subsequent to the installation and prior to acceptance of the work, the contractor shall prepare and issue record (as-built) drawings, in an AutoCAD format, that reflect the lengths of cables installed, the actual manner and conditions of installation, including all deletions from, additions to or departures from the contract documents. These documents are to include the information outlet station numbers and cable routing where it varies from the original plan.
- B. Provide revised cable termination schedules for all cables installed under the Work.
- C. Provide two (2) sets of Operation and Maintenance Manuals including wiring diagrams, parts list, shop drawings and manufacturers' information on all equipment and cables provided under this Work. Provide manuals in a high quality, 3 ring binder, completely indexed. Provide manuals within fifteen days of systems acceptance.

1.14 MANUFACTURER'S EXTENDED WARRANTIES

- A. Contractor shall guarantee telecommunications cabling systems in writing against defects in workmanship and defective materials for one (1) year after substantial completion.
- B. The contractor must guarantee that all 25 year manufacturer's extended warranties be afforded to City of New York.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

- A. Check actual site conditions prior to start of any work. Ensure all preceding trade work associated with the telecommunications system is accurate and complete before proceeding with installation or use of products specified in this section.
- B. Confirm all housings including back boxes, floor boxes and poke-throughs provided for the telecommunications connectivity system will support the installation of project approved manufacturer components prior to purchase of the components described in this specification.

3.3 INSTALLATION, GENERAL

- A. Follow manufacturer's instructions for installing, connecting, and adjusting all telecommunications riser and horizontal cabling and associated supporting, termination and splicing equipment, conduits, poke throughs, and ladder rack. Provide a copy of such instructions at the equipment during any work on the equipment.
- B. Keep all items protected before and after installation. Provide protection for exposed cables roughed onto the floor prior to their installation into the furniture systems. Clean up and remove all debris.
- C. If products and materials are specified herein for a specific item or system, use those products or materials. If products and materials are not listed, use first-class products and materials, subject to acceptance of shop drawings.
- D. Examine and compare the telecommunications cabling drawings and specifications with the drawings and specifications of other trades; report any discrepancies between them to the Commissioner and obtain written instructions for changes necessary in the work.
- E. The locations of structural and architectural features, existing sleeves, floor slots, termination and cross connect fields, panels, racks and other equipment indicated on the drawings are approximate. The contractor shall verify the existence, locations, and suitability of all such items, and shall present, required modifications to contract documents necessary to complete this work.

- F. Install and coordinate the telecommunications cabling work, including conduit, ladder rack, and poke throughs in cooperation with other trades and with vendors installing interrelated work. Before installation, make proper provisions to avoid interferences in a manner accepted by the Commissioner. All repairs or changes required in the work of the contractor, caused by his neglect, shall be made by the contractor, at the contractor's expense.

3.4 SPECIAL CONDITIONS

- A. Furnish, install, terminate and test all horizontal, riser and outlet cabling for all floors shown in the attached and associated drawings and described below:
1. Core drilling and the installation of aftersets, grommets access slots, sleeves, conduits, fire rated poke-throughs, and raceways required to route copper and fiber optic cabling will be furnished and installed by parties as indicated by contract documents. Where pathways furnished by others are not sufficient for the routing of cabling, this condition shall be brought to the attention of the Commissioner, in writing.
 2. As indicated, cabling shall run to workstation and other outlets through cavities in the drywall and openings in sheet metal or wooden studs within the drywall construction. The sheet metal studs will not be gasketed for this purpose, it shall be the contractor's responsibility to exercise extreme care in snaking cable through these areas to avoid damage to the cable jacketing.
 3. Information Outlet face plates for all boxes will be furnished and installed by cable contractor.
 4. All cabling shall be at least: 12" from high voltage lighting and fluorescent fixtures unless within a metal enclosure 72" from transformers and motors.

3.5 INSTALLATION

- A. Follow manufacturer installation instructions. If manufacturer's installation instructions conflict with the contract documents indicate such through an RFI(s) prior to installation.
- B. Most fiber and copper station cables will enter the MTR and TR Rooms through the conduits and overhead ladder rack, both as provided by others, based on the cable routing requirements reflected on drawings.
- C. Contractor shall take all necessary precautions to assure that the maximum tensile load and minimum bend radius of all cables (fiber and copper) are not exceeded. When terminating UTP cable, the contractor must maintain pair twists up to the termination point and the cable sheath shall not be removed more than 0.5" from the termination point. Velcro tie wraps are to be hand tightened on cables to prevent crimping cable sheath. Plastic tie wraps are not to be used on lateral cables. The contractor is responsible for protecting all connectorized cables from damage by other trades at the information outlet before and after installation of the outlet faceplates.



D. Termination Hardware:

1. All horizontal station cabling will be terminated on 8 pin modular patch panels. The fiber optic riser and tie cabling shall be terminated on fiber distribution coupler panels with LC connectors. All copper riser and tie cables shall be terminated on rack mounted 110 blocks.
2. All termination hardware shall be grounded and bonded according to applicable codes, TIA standards, and Section 27 05 26.

E. Voice and Data Risers:

1. As indicated on the drawings, fiber optic and copper riser cables shall be installed from the MDF/MTR room to the TR/IDF rooms. The contractor is responsible for supporting cables installed above hung ceilings separately from the ceiling supports, conduits, etc.

F. Horizontal Subsystem Cabling: All horizontal cables shall be installed as uninterrupted conductor sections between the TR and station outlets:

1. Installation of outlet jacks shall be coordinated by the contractor with the work of other trades, all working together.
2. Standard information outlets shall be housed in a single gang box, flush mount poke through, surface mount raceway, or furniture system raceway as indicated on the drawings. All horizontal cables shall be terminated on 8-pin modular jacks.
3. All installed connectors shall be protected and insulated during and following the installation. Protective caps or dust covers shipped with connectors shall be left in place or replaced by the contractor if found to be dislodged or damaged.

3.6 SOURCE MANUFACTURING AND QUALITY CONTROL

- A. Cables that are supplied by the contractor, and test outside of the factory test data by a margin of 10 percent on loss, may, at the Commissioner's option, be deemed non-usable and returned to the manufacturer for replacement.

3.7 POST IMPLEMENTATION TESTING

- A. Following the physical installation of the cabling, the contractor will conduct pre-checkout tests as described below, "Physical Inspection", prior to the formal acceptance tests with The City of New York.

3.8 PHYSICAL INSPECTION

- A. Prior to conducting any transmission testing, the following visual inspections will be performed:
1. Verify that all cable has been installed to full compliance with the proposal specifications.
 2. Check for physical damage to the Fiber Distribution Panels and termination hardware.



3. Check that all cabling is properly jacketed, installation properly labeled at both ends of the cable, innerduct and termination hardware is completed in all IDF's and the MDF Room.
4. Verify that all cable bends are within the manufacturer's specified bend radius.
5. Verify that all cabinets and racks (which require grounding) are properly grounded and comply with the National and Local Electrical Codes for grounding.
6. Verify that the cables are properly approved and structurally supported for termination.

3.9 RE-INSTALLATION

- A. No additional burden to the City of New York regarding costs, network down-time and/or end user interruption shall result from the re-installation of specified components. Scheduling for re-installation work shall be coordinated, in writing, with the Commissioner prior to beginning the work.

3.10 CLOSEOUT ACTIVITIES

- A. Contractor shall provide documentation of all telecommunications system components under this section utilized throughout the site for review and reference by the Commissioner.
- B. Contractor to submit all as-built drawings and any test documentation required prior to acceptance by the Commissioner.

END OF SECTION 27 10 00

SECTION 27 11 16 - COMMUNICATIONS CABINETS, RACKS, FRAMES AND ENCLOSURES

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. Provides specifications for network cabinets, racks, and telecommunications enclosure components utilized to house various telecommunications infrastructure components within technology distribution spaces.

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 ACTION SUBMITTALS

- A. Product Data:
 - 1. Submit all product data in accordance with DDC General Conditions and Section 27 10 00.
- B. As-Built Drawings
 - 1. Submit all as-built drawings in accordance with the requirements of Section 27 10 00.

1.5 QUALITY ASSURANCE:

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Component manufacturer shall be ISO 9001:2000 and offer products that are RoHS compliant.
- C. Closeout Submittals:
 - 1. As-Built Drawings:
 - a. Submit all as-built drawings in accordance with the requirements of Section 27 10 00.



- b. Shop drawings shall include evidence of cabinets, racks, and enclosures have been coordinated with field conditions and the work of other trades.
- c. This submittal may have a written component and a visual component for review and action by the Commissioner prior to installation.

PART 2 - PRODUCTS

2.1 2-POST RELAY RACKS

- A. Manufacturer List:
 - 1. Chatsworth Universal Racks
 - 2. Cooper B-line
 - 3. Hubbell
 - 4. Or approved equal
- B. Description:
 - 1. 2-Post relay racks shall be able to support and organize electronic equipment, cross-connection and/or termination hardware for fiber optic cabling, station cabling, riser cabling, or building entrance cabling as may be required by design.
 - 2. The rack face shall have conventional equipment and hardware mounting dimensions of EIA standard nineteen inch (19") wide by seven-foot (7'-0") or eight foot (8'-0") heights.
 - 3. The rack system shall be equipped for the required electrical bonding and grounding to meet TIA-606 Standards.
 - 4. All racks and rack components shall be black in color with rack unit marking in a contrasting color with frame components.
- C. Accessory Products:
 - 1. Rack-mounted vertical power strip. Refer to the TT-series drawings for power strip quantities.

2.2 EQUIPMENT CABINETS

- A. Manufacturer List:
 - 1. Chatsworth F Series Tera Frame
 - 2. Cooper B-line Delta
 - 3. APC
 - 4. Or approved equal
- B. Specification:
 - 1. Equipment cabinets shall contain mounting dimension of nineteen inch (19") by eighty-four inch (84") or ninety-six inch (96"); with a minimum of forty-five (45) rack units marked in a contrasting color.
 - 2. All cabinets shall allow a minimum inside front to back frame clearance of 42 inches (42").



3. Cabinets shall be 24 inches (24") in width as indicated on the drawings.
4. Cabinet Top must have minimum four (4) removable cable entry openings complete with grommets edge protection each with a minimum usable area of 10 square inches.
5. Cabinets and cabinet components shall be black in color.
6. Rated load for equipment cabinets shall be no less than 2500 pounds.
7. The fastening system used to mount equipment and telecommunications components shall be square-punched rail holes.
8. Front doors shall be single leaf, vented with minimum 85% free air.
9. Rear doors shall be solid split leaf where chimneys are installed and perforated split leaf where chimneys are not installed.
10. All doors must allow for tool-less removal and change of swing.
11. Locking front and rear door with minimum 2 key combinations.
12. Each cabinet shall have a solid, 1 piece locking side panel on each side.
13. Thermal management components including air dams and brush grommets to isolate hot/cold air for side to side and front to back cooled equipment.
14. Seismic anchor to conform to seismic zone and safety factor requirements.
15. Vertical cable management panels in 4 interior corners of cabinet.
16. Grounding accessories as required to bond all removable cabinet parts and cabinet to raised floor grounding system.
17. Accessory mounting brackets to accept mounting installation of two (2) vertical plug strips.
18. Provide 72 inch vertical grounding bus bar in accordance with section 27 05 26
19. Install cabinet with plastic blanking panels installed in all usable Rack Units.
 - a. For bottom 27 Rack Units use one piece plastic blanking panels.
 - b. For all rack units above use individual 1 Rack Unit blanking panels constructed from metal or UL 94 listed plastic, fastened to mounting rails with 4 locking (thread-less) fasteners.

2.3 4 POST RACKS

A. Specification:

1. Four Post Equipment racks shall contain mounting dimension of nineteen inch (19") by seventy-nine (79) inches.
2. Rated for minimum 2,000 lbs
3. Racks shall be constructed as 4-post units with front and back EIA mounting rails.
4. Nominally twenty-four (24) inches wide.
5. Racks shall be equipped with Vertical Cable Management channels with hinged cover doors, refer to 27 11 23.
6. The fastening system used to mount equipment and telecommunications components shall be speed nuts in pre-punched EIA rail holes.
7. Welded steel construction.
8. Adjustable
9. Seismic anchor to conform with seismic zone and safety factor requirements.

B. Required Product Options:



1. Thermal management components including air dams and brush grommets to isolate hot/cold air for side to side and front to back cooled equipment. Provide solution to install eight (8) side to side air flow devices.
2. Seismic anchor to conform with seismic zone and safety factor requirements.
3. Grounding accessories as required to bond all removable rack parts and bond rack to data center bonding back bone.
4. Accessory mounting brackets to accept mounting installation of two (2) vertical plug strips offset as required so as not to conflict with the installation and access to IT equipment.

C. Manufacturer List:

1. Chatsworth
2. Cooper B-Line
3. Hubbell
4. Or approved equal

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. Equipment cabinets, 2-post and 4-post relay racks:

1. Process:
 - a. Install all racks and cabinets per the manufacturer's recommended instructions.
 - b. Anchor all racks and cabinets to the concrete floor and cross brace to the cable runway system above.
 - c. Seismically brace the products indicated in this specification adhering to construction regulations relative to the buildings seismic zone.
 - d. Contractor shall request written authorization prior to drilling into any surface more than one and one half inch (1.5") in depth.

3.3 CLOSEOUT ACTIVITIES

- A. Contractor shall provide documentation of all telecommunications system components under this section utilized throughout the site for review and reference by the Commissioner.
- B. Contractor to submit all as-built drawings and any test documentation required prior to acceptance by the Commissioner.

END OF SECTION 27 11 16

SECTION 27 11 19 - COMMUNICATIONS TERMINATION BLOCKS AND PATCH 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).
- B. Related Section:
 - 1. 271000 Structured Cabling

1.2 SUMMARY

- A. Provides specifications for wall and rack/cabinet-mounted blocks, patch bays, and patch panel components utilized to terminate various telecommunications infrastructure cabling and connectivity

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 ACTION SUBMITTALS

- A. Product Data:
 - 1. Submit all product data in accordance with DDC General Conditions and Section 271000.
- B. Shop Drawings:
 - 1. Submit all product data in accordance with DDC General Conditions and Section 271000.
- C. As-Built Drawings:
 - 1. Submit all product data in accordance with DDC General Conditions and Section 271000.
 - 2. Submit as-built drawings a minimum of two (2) weeks after completion of all Division-27 work for the Commissioner's reference.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Qualifications – Manufacturer:
 - 1. Component manufactures shall be ISO 9001:2000 and offer products that are RoHS compliant.

PART 2 - PRODUCTS

2.1 OPTICAL FIBER PATCH BAYS

- A. Manufacturer List:
 - 1. Corning
 - 2. Leviton
 - 3. Hubbell
 - 4. Or approved equal
- B. Description:
 - 1. Optical fiber patch bay housings shall be provided for cross-connecting or inter-connecting purposes between OSP, ISP, and/or distribution cables and the active network electronic switches, as noted in the TT-series drawings.
 - 2. All optical fiber termination panels shall be complete factory-provided assemblies that contain termination panels, factory-polished "pig tails", internal bend radius components and splice shelves that are provided in a housing which includes an accessible rear access hatch.
 - 3. All connections between the horizontal and backbone optical fibers to the factory-provided "pig tails" within the termination shelves shall be made with a computer controlled, direct core, 3-axis electronic alignment, LED screen, push button controlled fusion splicing machine and protected by heat shrink fusion splice protection sleeves installed by an integrated heater within the same fusion splice machine.
 - 4. All optical fiber patch panel trays and associated bulkhead inserts shall have factory numerical labeling included in the design and presentation to the user side of the panel.
 - 5. The optical fiber patch panel bulkheads that house the terminating modules for the fiber backbone cabling and any station optical fiber cabling shall accept 568-C.3 standard-compliant LC connectors on the end of each factory-terminated pigtail assembly.
- C. Accessory Products:
 - 1. Provide any accessory products related to the optical fiber termination shelves to provide a complete and functional infrastructure system.

2.2 UTP PATCH PANELS

A. Manufacturer List:

1. Belden
2. Leviton
3. Hubbell
4. Or approved equal

B. Description:

1. Patch panels are to be rated for Category 6.
2. Patch panels are to be flat and rack/cabinet mountable within industry standard TIA 19" mounting rails unless otherwise noted.
3. All patch panels are to provide adequate space for individual port labeling on the front and cable/connector labeling on the back.
4. All installed UTP patch panels shall be twenty-four (24) or forty-eight (48) port patch panels with open modular ports that accept a single RJ 45-type module for each cable or 110-style IDC rear termination patch panels as indicated on drawings.
5. The performance criteria for the UTP patch panels must meet or exceed the performance parameters for frequency, attenuation, near end cross-talk (NEXT), attenuation to cross-talk ratio (ACR), power sum NEXT (PS-NEXT), power sum ACR (PS-ACR), equal level far end cross-talk (ELFEXT), power sum far end cross-talk (PS-FEXT), and return loss (RL) as set forth in TIA-568-C Category-6 standards.
6. Any unused UTP patch panel ports shall be filled with blank inserts that are black in color.

C. Accessory Products:

1. Provide any accessory products related to the UTP patch panels to provide a complete and functional infrastructure system.

2.3 OPTICAL FIBER MODULE

A. Manufacturer List:

1. Corning: 12 fiber Single-mode SC-MTP Edge Module
2. Corning: 12 fiber OM4 Multimode SC-MTP Edge Module
3. Panduit Fiber Solution
4. Hubble
5. Or approved equal

B. Specification:

1. Optical Fiber Modules shall provide a means for joining MTP terminated optical fiber trunks and Harnesses entering the back of an appropriately designed connector housing to jumpers or cables entering the front of the housing.
2. Optical fiber module shall be of the same manufacturer of optical fiber trunk cable assemblies and fiber module housings.
3. Optical fiber modules shall be dimensionally compatible with fiber module housing.



4. All optical fiber modules shall provide MPO connectors on the rear and Duplex LC connectors on the front.
5. Fully populate all installed optical fiber module housings with fiber modules.

C. Accessory Products:

1. Provide any accessory products related to the optical fiber termination shelves to provide a complete and functional infrastructure system.
2. Contractor to provide a cable ground kit.

2.4 FIBER PATCH PANELS (OPTICAL FIBER MODULE HOUSINGS)

A. Specification:

1. All Optical fiber Module housings installed in the IDF rooms shall be 1 rack unit (1.75 inches), 2 rack unit (3.5 inches) and 4 rack units (7 inches) in height and mount within industry standard EIA-301 compatible 465mm (18.3 inch) mounting rails.
2. Housings shall have capacity for a minimum of 8, 16, or 32 optical fiber modules where each module has the capacity for 12 strands of fiber terminated on duplex LC connectors.
3. Housings must have an overall minimum capacity of 96 strands (1RU housings), 192 strands (2RU housings) and 384 strands (4RU housings) of optical fiber.
4. Shall conform to the requirements of TIA-568 standards document.
5. Module housings shall be of the same manufacturer of Modules and fiber optic trunk cable assemblies.
6. Construction of housing shall include:
 - a. 16-gauge cold rolled steel chassis.
 - b. Hinged/removable front door complete with lock.
 - c. Plastic insert to fit lock opening if lock is not installed or is removed.
 - d. Retaining bracket to prevent door from unintentionally sliding off hinges
 - e. The housing shall provide sufficient quantities of grommets openings for all combinations of cable configurations indicated on the drawings.
7. Molded plastic parts shall meet the flammability requirements of UL 94 V-0.
8. The module housing must provide a labeling system that complies with TIA-606 standard.
9. Front cable management must be provided in sufficient quantities and capacities to provide management for patching of 100% of fiber port capacity using duplex fiber LC patch cords while not exceeding 60% fill ratio of front fiber jumper cord routing guides.
10. Rear cable management shall include cable clamping mechanisms to provide support and strain relief to optical fiber trunk cables ranging in diameter from .19 inches to .75 inches.

B. Accessory Products:

1. Provide any accessory products related to the optical fiber termination shelves to provide a complete and functional infrastructure system.

C. Manufacturer List:

1. Corning Cable Systems, 2RU housings: EDGE-02U (IDF rooms and MDF room) and EDGE-04U (MDF ROOM)
2. Hubble
3. Panduit Fiber solution



4. Or approved equal

2.5 WIREMOLD OUTLETS

- A. Description:
 1. Provide mounting frame to install jacks inside wiremold raceway.
 2. Frames shall be compatible with duplex style raceway cover plate.

2.6 MUTLI-PAIR CATEGORY 3 BET PROTECTION BLOCKS

- A. Description:
 1. Provide Building entrance terminal blocks for all cables where required by code.
 2. Building entrance terminal cabinets shall be 16 AWG powder coated steel construction.
 3. Internal 26 AWG fuse link
 4. External ground conductor lug accepting 6 – 14 AWG wire size
 5. UL947 listed
 6. Utilize standard 110 IDC connectors accepting 22 – 26 AWG wire
- B. Manufacturer
 1. Circa Telecom, model number 1880ECA1-50
 2. Porta System Lightning Protection
 3. Hubble
 4. Approved equivalent
- C. Protectors
 1. Provide 5-pin solid state UL-497 primary protector for digital and analog communications circuits to fully populate all pairs in all protection blocks. Protectors shall include positive temperature coefficient technology to self-reset and provide protection from sneak current.

2.7 4-PAIR CATEGORY 6 OUTDOOR DEVICE CABLING

- A. Description:
 1. For cables to outdoor devices (where devices is not located within interior of building) provide the following 4-pair primary and secondary protection device.
 2. Contractor to provide outdoor rated cables for outdoor devices.
 3. Contractor to provide submittals for final review.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

- A. Check actual site conditions prior to start of any work. Ensure all preceding trade work associated with the telecommunications system is accurate and complete before proceeding with installation or use of products specified in this section. Examples of work which must be checked include, but are not limited to:
1. Electrical requirements (conduit installation and capacity)
 2. The telecommunications rooms are the size shown on the project drawings.
 3. Adequate clearances of doors, riser spaces and ceilings for all component of the telecommunications system.
 4. Examine and compare the telecommunications drawings and specifications with the drawings and specifications of other trades. Report any discrepancies between them to the Commissioner and obtain written instructions for changes or revisions.

3.3 OPTICAL FIBER PATCH BAYS/ENCLOSURES AND UTP PATCH PANELS

- A. Process:
1. Install all optical fiber and UTP components under the guidelines of the manufacturer's recommended instructions and per all TIA-568-C standards and manufacturer-approved industry practices as shown in the TT-series drawings.
 2. The installation and performance parameters of all installed cable termination panels shall be verified by the contractor through TIA-568-C testing procedures.
 3. Label all cable termination panels to identify each port and each specific panel in accordance with the TIA-606 labeling scheme approved by the Commissioner.

END OF SECTION 27 11 19

SECTION 27 11 23 - COMMUNICATIONS CABLE MANAGEMENT AND LADDER RACK**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).
- B. Related Section:
 - 1. 27 10 00 Structured Cabling

1.2 SUMMARY

- A. Provides specifications for cable management components utilized inside each telecommunications distribution space to support the management of horizontal workstation cabling, backbone cabling, and patch cords.
- B. Administrative Requirements:
 - 1. Coordination:
 - a. Install and coordinate the telecommunications cabling work in cooperation with other trades installing interrelated work. Before installation, make proper provisions to avoid interference in a manner accepted by the Commissioner. Any repairs or changes made necessary in the contract work, caused by the contractor's neglect, shall be made by the contractor at their own expense.

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 ACTION SUBMITTALS

- A. Product Data:
 - 1. Submit all product data in accordance with 27 10 00 and the general requirements of the construction documents.
 - 2. Shop Drawings:
 - a. Submit all product data in accordance with 27 10 00 and the general requirements of the construction documents.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

PART 2 - PRODUCTS

2.1 VERTICAL CABLE MANAGEMENT

- A. Manufacturer List:
1. Chatsworth Evolution Cable Management System.
 2. Cooper B-line
 3. Hubbell
 4. Or approved equal
- B. Description:
1. All vertical cable management on 19" relay racks shall be as indicated on the TT-series drawings.
 2. All vertical cable management on 19" relay racks shall be seven foot (7'-0") in height where 7' racks are used and 8' in height where 8' racks are used.
 3. Vertical cable management shall be double sided and shall provide sufficient depth to allow for standard copper and fiber bend radii internally and when entering and/or leaving the wire management frame.
 4. Dual hinged, removable, full-length doors shall be provided on the front and back of the management.
 5. All components of the cable management system shall match the color of the relay rack (271116).
- C. Accessory Products:
1. Provide any accessory products related to the wire management components to provide a complete and functional infrastructure system.

2.2 HORIZONTAL CABLE MANAGEMENT

- A. Manufacturer List:
1. Chatsworth Evolution Horizontal Cable Management System.
 2. Cooper B-line
 3. Hubbell
 4. Or approved equal
- B. Description:
1. All horizontal cable management on 19" relay racks shall be provided in rack unit dimensions as noted in the TT-series drawings. All 19" horizontal managers must have sufficient depth and surfaces to allow for UTP copper cables bend radii.
 2. Horizontal cable managers shall be single sided and shall provide sufficient depth to allow for UTP copper and fiber bend radii internally and when entering and/or leaving the wire management frame.
 3. All components of the cable management system be of the same color as the rack it is installed in (271116).

C. Accessory Products:

1. Provide any accessory products related to the wire management components to provide a complete and functional infrastructure system.

2.3 CABLE RUNWAY SYSTEM:

- A. Used wherever vertical tray and/or ladder rack is indicated on drawings.
- B. Refer to 270528.36 (Cable Trays for Communications Systems) for specification of ladder rack

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

- A. Check actual site conditions prior to start of any work. Ensure all preceding trade work associated with the telecommunications system is accurate and complete before proceeding with installation or use of products specified in this section. Examples of work which must be checked include, but are not limited to:
 1. Electrical requirements (conduit installation and capacity).
 2. The telecommunications rooms are the size shown on the project drawings.
 3. Adequate clearances of doors, riser spaces, and ceilings for all component of the telecommunications system.
 4. Examine and compare the telecommunications drawings and specifications with the drawings and specifications of other trades. Report any discrepancies between them to the Commissioner and obtain written instructions for changes or revisions.
- B. Vertical and Horizontal Cable Management:
 1. Install all vertical and horizontal cable management per the manufacturer's recommended installation instructions, as indicated in the TT-series drawings.
 2. All cable bundles inside the telecommunications rooms shall be secured with Velcro cable wraps; plastic wire ties are not acceptable.
 3. Velcro wraps shall not be pulled tight enough to kink the cable jacket.
- C. Cable Runway System:
 1. Install all vertical and horizontal cable management per the manufacturer's recommended installation instructions, as indicated in the project drawings.
 2. Inside IT spaces, the primary cable transport system shall be the overhead cable runway system, as shown in the TT-series drawings. Contractor-installed cable runway system



- shall include all components to complete the installation whether indicated in the contract documents or implied by the design.
3. Install all components of the cable runway system under the codes, standards, guidelines, and manufacturer recommendations.
 4. Vertical support to the slab above shall be provided if a cable runway section spans a distance greater than four (4) feet.

END OF SECTION 27 11 23

SECTION 27 11 26 - COMMUNICATIONS RACK MOUNTED POWER PROTECTION AND POWER STRIPS

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).
- B. Related Section:
 - 1. 27 10 00 Structured Cabling

1.2 SUMMARY

- A. Provides specifications for the provision and installation of equipment power strips in rack or cabinet frames within telecommunications distribution spaces.
- B. Section Includes:
 - 1. Vertical Power Strips

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 ACTION SUBMITTALS

- A. Product Data:
 - 1. Submit all product data in accordance with DDC General Conditions and Section 27 10 00.
- B. As-Built Drawings:
 - 1. Submit all as-built drawings in accordance with the requirements of Section 27 10 00.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

PART 2 - PRODUCTS

2.1 RACK AND CABINET MOUNTED PLUGSTRIPS

A. General Specification for all plugstrips:

1. Plug strip must use an IP routable protocol.
2. Power strips must be UL listed for Information Technology use.
3. Include a Digital ammeter for displaying current draw on each phase of the plug strip unit and each individual receptacle.
4. Each plug strip shall have the capability through SNMP interface and through software application (not browser based) to perform the following:
 - a. switch the entire plug strip on and off
 - b. switch individual receptacle on and off
 - c. Monitor and report total plug strip power through SNMP interface and monitoring software
 - d. Individually monitor and report power used by each receptacle.
 - e. Individually monitor and report power used by each phase
 - f. All rack-mounted vertical power strips shall be provided with rear facing stand off or internal cabinet mounting brackets that are both offset one inch (1") to the side of the mounting rails so as not to interfere with the equipment mounted within the rack and provided with sufficient depth to allow access to the vertical and horizontal wire managers.
 - g. Accessory Products:
 - 1) 2 probes for monitoring temperature
 - 2) 2 probes for monitoring humidity
 - 3) Provide hardware, including screws, brackets, standoffs, etc., necessary to install plug strip within server cabinets and the rear of equipment racks (open frame, relay racks) so as not to interfere with or obstruct airflow to IT equipment.
 - 4) Modules or interfaces necessary to connect the plug strip to an Ethernet network.
 - 5) Plug strip Management software application (not browser based), to manage, view, log, record, data from plug strips. Provide minimum 50 user license.
 - 6) Provide any accessory products related to the power strip devices required to provide a complete and functional infrastructure system.

B. Low density vertical power – provide for each 15-20r electrical receptacle indicated on the tt drawings:

1. Manufacturer List:
 - a. Eaton
 - b. Geist
 - c. Servertech
 - d. Or approved equal
2. Description:
 - a. Low density power strips shall have the following:
 - 1) Twenty (20) 5-15R receptacles.
 - 2) L5-20P plug.
 - b. All rack and cabinet-mounted vertical power strips shall be provided with rear facing stand off or internal cabinet mounting brackets that are both offset one inch (1") to the



side of the mounting rails so as not to interfere with the equipment mounted within the rack and provided with sufficient depth to allow access to the vertical and horizontal wire managers.

- C. Medium density vertical power – provide for each l6-30r electrical receptacle indicated on the tt drawings:
1. Manufacturer List:
 - a. Eaton
 - b. Geist
 - c. Servertech
 - d. Or approved equal
 2. Description:
 - a. Medium density power strips shall provide
 - 1) Twenty four (24) C13 receptacles
 - 2) Two (2) C19 receptacles.
 - 3) L6-30P plug.
 - b. All rack and cabinet-mounted vertical power strips shall be provided with rear facing stand off or internal cabinet mounting brackets that are both offset one inch (1”) to the side of the mounting rails so as not to interfere with the equipment mounted within the rack and provided with sufficient depth to allow access to the vertical and horizontal wire managers.
 3. Accessory Products:
 - a. Provide any accessory products related to the power strip devices required to provide a complete and functional infrastructure system.
- D. High density vertical power – provide for each l14-30r electrical receptacle indicated on the tt drawings:
1. Manufacturer List:
 - a. Eaton
 - b. Geist
 - c. Servertech
 - d. Or approved equal
 2. Description:
 - a. Medium density power strips shall provide a minimum of
 - 1) Twenty four (24) C13 receptacles
 - 2) FOUR-(4) C19 receptacles.
 - 3) L6-30P plug.
 - b. All rack and cabinet-mounted vertical power strips shall be provided with rear facing stand off or internal cabinet mounting brackets that are both offset one inch (1”) to the side of the mounting rails so as not to interfere with the equipment mounted within the rack and provided with sufficient depth to allow access to the vertical and horizontal wire managers.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 PROCESS

- A. Secure power strips and other accessories using appropriate factory-manufactured screws.
- B. Final location of each power strip to be coordinated with the designer and the City of New York.

END OF SECTION 27 11 26

SECTION 27 13 13 - COMMUNICATIONS COPPER BACKBONE CABLE

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).
- B. Related Section:
 - 1. 27 10 00 Structured Cabling

1.2 SUMMARY

- A. Provides specifications for high pair count UTP copper backbone cabling to distribute network signals between telecommunications distribution spaces.
- B. Section Includes:
 - 1. Category 6 Multi-Pair UTP Cable
- C. References
 - 1. Abbreviations and Acronyms:
 - a. BICSI: Building Industry Consulting Service International
 - b. IDF: Intermediate Distribution Facility
 - c. IT: Information Technology
 - d. MDF: Main Distribution Facility
 - e. RCDD: Registered Communications Distribution Designer
 - f. RoHS: Restriction of Hazardous Substances
 - g. TCIM: Telecommunication Cabling Installation Manual
 - h. TDMM: Telecommunications Distribution Methods Manual
 - i. TIA: Telecommunications Industry Association
 - j. TSER: Telecommunications Service Entry Room
 - k. UTP: Unshielded Twisted Pair
 - 2. Reference Material: Refer to the most recent version, update or addenda:
 - a. TIA-568-C.1: Commercial Building Telecommunications Cabling Standard, Edition C, Publish Date 05/03/2012.
 - b. TIA-568-C.2: Balanced Twisted-Pair Telecommunications Cabling And Components Standards, Edition C, Publish Date May 2010.
 - c. TIA-569: Telecommunications Pathways And Spaces, Edition C, Publish Date 05/03/2012.
 - d. TIA-758: Customer-owned Outside Plant Telecommunications Infrastructure Standard.
 - e. TIA-942: Telecommunications Infrastructure Standard for Data Centers, Revision/Edition A, published August 2012.
 - f. Telecommunications Distribution Methods Manual (TDMM) 12th.



g. Information Transport Systems Installation Methods Manual (ITSIMM) 6th Edition.

D. Administrative Requirements:

1. Coordination:

- a. Install and coordinate the telecommunications cabling work in cooperation with other trades installing interrelated work. Before installation, make proper provisions to avoid interference in a manner accepted by the Commissioner. Any repairs or changes made necessary in the contract work, caused by the contractors neglect, shall be made by the contractor at their own expense.

2. Scheduling:

- a. Contract Documents and the overall construction schedule must be carefully reviewed to determine all required interfacing and timing of the work.

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 ACTION SUBMITTALS:

A. Product Data:

1. Submit all product data in accordance with DDC General Conditions and Section 27 10 00.

B. Shop Drawings:

1. Submit all shop drawings in accordance with the requirements of Section 27 10 00.

C. As-Built Drawings:

1. Submit all as-built drawings in accordance with the requirements of Section 27 10 00.

1.5 QUALITY ASSURANCE:

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

B. Qualifications – Manufacturer:

1. Component manufactures shall be ISO 9001:2000 and offer products that are RoHS compliant.

2. Qualifications – Installer:

- a. The contractor shall submit documentation that within the past 12 months, a minimum of 75% of all installation personnel have been trained or certified by the manufacturer of the products they are installing.

PART 2 - PRODUCTS

2.1 BACKBONE MULTI-PAIR UTP CABLE



- A. Manufacturer List:
 - 1. Berktek
 - 2. Superior Essex
 - 3. Belden
 - 4. Or approved equal
- B. Description:
 - 1. All voice and data ISP and OSP copper backbone cable is to be rated per the constructed conditions and verified by the contractor prior to installation. Per code, plenum cable is to be installed at all times when a communications cable is exposed in a plenum air space. It is the responsibility of the contractor to bid, purchase, install, and verify the rating of the ISP and OSP cable for the specific construction conditions.
 - 2. Backbone cables that are exposed to moisture shall contain moisture-blocking materials to prevent moisture damage to cable performance.
 - 3. Backbone multi-pair UTP cable installed inside conduit ductbanks that are buried below grade (even those buried beneath the building slab) shall require moisture-blocking materials.
 - 4. Backbone multi-pair UTP cable shall be Category 6 copper UTP, twenty-four (24) AWG cable.
 - 5. The total pair count of each Backbone Multi-pair cable shall be provided as indicated on the project drawings.
 - 6. The performance criteria for the UTP backbone cable shall be in accordance with the specific standards for the particular cable's rating.
 - 7. Select an appropriate cable construction, including external jacket properties, when installing cables in aerial, outdoor, underground and corrosive environments.
- C. Accessory Products:
 - 1. Provide any accessory products related to the UTP copper backbone cabling required to provide a complete and functional infrastructure system.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

- A. Check actual site conditions prior to start of any work. Ensure all preceding trade work associated with the telecommunications system is accurate and complete before proceeding with installation or use of products specified in this section. Examples of work which must be checked include, but are not limited to:
 - 1. Electrical requirements (conduit installation and capacity).
 - 2. The telecommunications rooms are the size shown on the project drawings.
 - 3. Adequate clearances of doors, riser spaces and ceilings for all component of the telecommunications system.



4. Examine and compare the telecommunications drawings and specifications with the drawings and specifications of other trades. Report any discrepancies between them to the Commissioner and obtain written instructions for changes or revisions.
- B. Copper Backbone Cabling:
1. Process:
 - a. Install all copper backbone cable per the manufacturer's recommended installation instructions, under the guidelines of TIA-568-C and BICSI, and in quantities indicated in the TT-series drawings.
 - b. Install all cables with proper attention paid to bend radii, pulling method, attachment method, and pulling forces. The cable manufacturer's specifications for each particular cable type shall be followed exactly.
 - c. Backbone cable shall be visually inspected for insufficient bend radius during and after pulling. Damaged cables, or those installed under questionable methods and/or circumstances shall be replaced at no additional cost to the City of New York.
 - d. All cable shall be pulled using an appropriate measuring device to ensure that the specified force is not exceeded as noted in BICSI guidelines.
 - e. Install backbone cables "end-to-end" without splicing between the intended termination points within each telecommunications room with attention paid to aesthetic means and methods when routing cabling within IT spaces.
 - f. No backbone cable shall be left unsupported for more than three (3) feet vertically or horizontally at any time.
 - g. All backbone cables shall be clearly labeled on both ends and in an accessible location no more than one (1) foot from each cable end.
- C. Re-Installation:
1. No additional burden to the City of New York regarding costs, network down-time and/or end user interruption shall result from the re-installation of specified components. Scheduling for re-installation work shall be coordinated, in writing, with the Commissioner prior to beginning the work.
- D. Closeout Activities:
1. Contractor shall provide documentation of all telecommunications system components under this section utilized throughout the site for review and reference by the Commissioner.
 2. Contractor to submit all as-built drawings and any test documentation required prior to acceptance by the City of New York.

END OF SECTION 27 13 13

SECTION 27 13 23 - COMMUNICATIONS OPTICAL FIBER BACKBONE 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).
- B. Related Section:
 - 1. 27 10 00 Structured Cabling

1.2 SUMMARY

- A. Provides specifications for optical fiber backbone cabling to distribute optical network signals between telecommunications distribution spaces.

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 ACTION SUBMITTALS

- A. Product Data:
 - 1. Submit all product data in accordance with DDC General Conditions and Section 27 10 00.
 - 2. Shop Drawings:
 - a. Submit all shop drawings in accordance with the requirements of Section 27 10 00.
 - 3. As-Built Drawings:
 - a. Submit all as-built drawings in accordance with the requirements of Section 27 10 00.
- B. Operation and Maintenance Data: For each product
 - 1. Manufacturer's manual
- C. Record Documentation: Record drawings indicating the location of all the components and component identification
- D. Field Test Reports:
 - 1. Cable test results



1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

PART 2 - PRODUCTS

2.1 IN-BUILDING BACKBONE SINGLE-MODE OPTICAL FIBER CABLE:

- A. Manufacturer List:
1. Corning Cable Systems
 2. AFL
 3. Siemon
 4. Or approved equal
- B. Description:
1. All backbone single-mode optical fiber cable shall be capable of Ethernet signal transmission at 10 Gb/s up to 5000 meters in the 1310nm operating window. Maximum attenuation for a single-mode outside plant cable shall be no greater than 0.4dB per kilometer and 0.3dB per kilometer using 1310nm and 1550nm wavelengths respectively.
 2. Each optical fiber strand shall be sufficiently free of surface imperfections and inclusions to meet the optical, mechanical, and environmental requirements of this specification and all TIA-568-C.3 and 568-C.1 performance parameters.
 3. All optical fibers inside each individual cable shall be provided in counts indicated on the drawings and usable to the fullest capacity specified by the manufacturer and meet required specifications at all times.
 4. All ISP single-mode optical fiber cable jackets shall have the industry standard yellow colored jacket and the cable shall be spirally wrapped and encased within an interlocking armored metal made of aluminum or galvanized steel without interruption from end to end for protection and strength. The metallic armor shall also be wrapped in a yellow colored sheath to designate the type of optical fiber.
 5. The optical fiber cables shall be rated per the installation environment as required. Contractor to select an appropriate cable construction, including external jacket properties, when installing optical fiber cables.
 6. All SMF shall meet or exceed TIA compliant network cable-testing device certification by an independent laboratory, such as ETL, for verification of high speed, TIA-568-C-compliant performance.
- C. Accessory Products:
1. Provide any accessory products related to the optical fiber backbone cabling required to provide a complete and functional infrastructure system.

2.2 IN-BUILDING BACKBONE LASER-OPTIMIZED MULTIMODE OPTICAL FIBER CABLE



A. Manufacturer List:

1. Corning Cable Systems
2. Leviton
3. Panduit
4. Or approved equal

B. Description:

1. All Multimode backbone optical fiber cables shall be OM4.
2. All backbone LOMMF cables shall be capable of Ethernet signal transmission at 10 Gb/s up to 300 meters at 500/2000 MHz/km modal bandwidth, while allowing the use of low-cost, 850 nm vertical cavity surface emitting laser (VCSEL).
3. Each optical fiber strand shall be sufficiently free of surface imperfections and inclusions to meet the optical, mechanical, and environmental requirements of this specification and all TIA-568-C.3 and 568-C.1 performance parameters.
4. All optical fibers inside each individual cable shall be provided in counts indicated in the TT-series drawings and be usable to the fullest capacity specified by the manufacturer and meet required specifications at all times.
5. The optical fiber shall support LASER-based 10 Gb/s operation (IEEE 802.3xx) in the 10GBASE-S operating window (850 nm) at a minimum of 300 meters.
6. All inside-plant 50 µm multi-mode optical fiber cable jackets shall have the industry standard aqua colored jacket and the cable shall consist of an all-dielectric armor.
7. The optical fiber cables shall be rated per the installation environment that is shall be installed in (Indoor or Outdoor rated).

C. Accessory Products

1. Provide any accessory products related to the optical fiber backbone cabling required to provide a complete and functional infrastructure system.

2.3 OUTSIDE PLANT SINGLE-MODE OPTICAL FIBER CABLE:

A. Manufacturer List:

1. Corning Cable Systems
2. AFL
3. Siemon
4. Or approved equal

B. Description:

1. All backbone single-mode optical fiber cable shall be capable of Ethernet signal transmission at 10 Gb/s up to 5000 meters in the 1310nm operating window. Maximum attenuation for a single-mode outside plant cable shall be no greater than 0.4dB per kilometer and 0.3dB per kilometer using 1310nm and 1550nm wavelengths respectively.
2. Each optical fiber strand shall be sufficiently free of surface imperfections and inclusions to meet the optical, mechanical, and environmental requirements of this specification and all TIA-568-C.3 and 568-C.1 performance parameters.



3. All optical fibers inside each individual cable shall be provided in counts indicated on the drawings and usable to the fullest capacity specified by the manufacturer and meet required specifications at all times.
4. All ISP single-mode optical fiber cable jackets shall have the industry standard yellow colored jacket and the cable shall be spirally wrapped and encased within an interlocking armored metal made of aluminum or galvanized steel without interruption from end to end for protection and strength. The metallic armor shall also be wrapped in a yellow colored sheath to designate the type of optical fiber.
5. All SMF shall meet or exceed TIA compliant network cable-testing device certification by an independent laboratory, such as ETL, for verification of high speed, TIA-568-C-compliant performance.

C. Accessory Products:

1. Provide any accessory products related to the optical fiber backbone cabling required to provide a complete and functional infrastructure system.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

- A. Check actual site conditions prior to start of any work. Ensure all preceding trade work associated with the telecommunications system is accurate and complete before proceeding with installation or use of products specified in this section. Examples of work which must be checked include, but are not limited to:
1. Electrical requirements (conduit installation and capacity).
 2. The telecommunications rooms are the size shown on the project drawings.
 3. Adequate clearances of doors, riser spaces and ceilings for all component of the telecommunications system.
 4. Examine and compare the telecommunications drawings and specifications with the drawings and specifications of other trades. Report any discrepancies between them to the Commissioner and obtain written instructions for changes or revisions.
- B. Backbone Optical Fiber (SMF and LOMMF) Cable:
1. Process:
 - a. Install all backbone cable per the manufacturer's recommended installation instructions, under the guidelines of TIA-568-C and BICSI, and in quantities indicated in the TT-series drawings.
 - b. Install all cables with proper attention paid to bend radii, pulling method, attachment method, and pulling forces. The cable manufacturer's specifications for each particular cable type shall be followed exactly.



- c. Backbone cable shall be visually inspected for insufficient bend radius during and after pulling. Damaged cables, or those installed under questionable methods and/or circumstances shall be replaced at no additional cost to the City of New York.
- d. All cable shall be pulled using an appropriate measuring device to ensure that the specified force is not exceeded as noted in BICSI guidelines.
- e. Install backbone cables with attention paid to aesthetic means and methods when routing cabling within IT spaces. No backbone cable shall be left unsupported for more than three (3) feet vertically or horizontally at any time.
- f. All backbone cable shall be securely fastened to the termination shelf in a way that does not damage the optical fiber strands or impede the performance of the media. This secure fastening method shall also serve to ensure a secure termination environment.
- g. A minimum of three feet (3'-0") of each optical fiber strand shall be left protected within the termination shelf for any future re-termination of a particular optical fiber strand.
- h. All backbone cables shall be clearly labeled on both ends and in an accessible location no more than one (1) foot from each cable end.

C. Re-Installation:

- 1. No additional burden to the City of New York regarding costs, network down-time and/or end user interruption shall result from the re-installation of specified components. Scheduling for re-installation work shall be coordinated, in writing, with the Commissioner prior to beginning the work.

D. Closeout Activities:

- 1. Contractor shall provide documentation of all telecommunications system components under this section utilized throughout the site for review and reference by the Commissioner.
- 2. Contractor to submit all as-built drawings and any test documentation required prior to acceptance by the City of New York.

END OF SECTION 27 13 23



THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 27 13 23.13 - COMMUNICATIONS OPTICAL FIBER SPLICING AND TERMINATIONS

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).
- B. Related Sections:
 - 1. 27 10 00 Structured Cabling

1.2 SUMMARY

- A. Provides specifications for optical fiber cable termination and splicing for each strand of optical fiber inside a patch bay or at each workstation outlet location.
- B. References:
 - 1. Abbreviations and Acronyms:
 - a. APC: Angled Physical Connector
 - b. BICSI: Building Industry Consulting Service International
 - c. EIA: Electronics Industry Alliance
 - d. IDF: Intermediate Distribution Facility
 - e. ISP: Inside Plant
 - f. IT: Information Technology
 - g. LC: A type of small form factor optical fiber connector
 - h. LOMMF: Laser Optimized Multimode Fiber
 - i. MDF: Main Distribution Facility
 - j. OSP: Outside Plant
 - k. RCDD: Registered Communications Distribution Designer
 - l. RoHS: Restriction of Hazardous Substances
 - m. SMF: Single-mode Fiber
 - n. TCIM: Telecommunication Cabling Installation Manual
 - o. TDMM: Telecommunications Distribution Methods Manual
 - p. TIA: Telecommunications Industry Association
 - 2. Reference Material: Refer to the most recent version, update or addenda:
 - a. TIA-568-C.1: Commercial Building Telecommunications Cabling Standard, Edition C, Publish Date 05/03/2012.
 - b. TIA-568-C.3: Optical Fiber Cabling Components Standard, Edition C, Publish Date 10/13/2011.
 - c. TIA-598-C: Optical Fiber Color Coding, Published 2005.
 - d. TIA-758: Customer-owned Outside Plant Telecommunications Infrastructure Standard, 2004



- e. Telecommunications Distribution Methods Manual (TDMM) 12th Edition
- f. Information Transport Systems Installation Methods Manual (ITSIMM) 6th Edition

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 ACTION SUBMITTALS

A. Product Data:

- 1. Submit all product data in accordance with DDC General Conditions and Section 27 10 00.
- 2. Submit product cut sheets and a detailed list of components a minimum of six (6) weeks prior to commencement of Division-27 work for the Commissioner review and action.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

PART 2 - PRODUCTS

2.1 FUSION SPLICING DEVICE

A. Manufacturer List:

- 1. Corning Cable Systems iLID Series Splicing Device
- 2. Panduit Corp.
- 3. Leviton
- 4. Or Approved Equal

B. Description:

- 1. The fusion device shall be portable, fully automatic and compact.
- 2. Splicer electrodes shall contain an arc-stabilizing feature to prevent spontaneous position shift of the arc emission zone to reduce the average splice loss by up to 50% and also the standard deviation compared to standard electrodes. The splicer shall require minimal maintenance, allowing up to 7000 splices between cleanings.
- 3. Procedures such as pre-alignment, cleaning, gap-setting, cleave angle monitoring, core-to-core alignment and glass fusion shall be microprocessor-controlled. Multiple splice programs with individual parameter settings shall be selectable, with seven pre-set single-mode and two multimode programs.
- 4. Course pre-alignment shall be performed automatically; therefore, accurate manual pre-alignment of the fibers shall not be necessary. Precise pre-alignment in z-axis shall be automatically performed with two-step motors. Fine positioning and final alignment of the fibers in three (x, y and z) directions shall be automatically performed with piezo-ceramic actuators, which have a positioning resolution better than 0.1 μm .



5. Upon completion of the splice, the splice loss shall be evaluated automatically. The splice loss value shall be displayed on the LCD display in decibels (dB).
6. The splicer shall be compliant with FCC CISPR 22 EMI and with the “Electromagnetic Compatibility” directive 89/336/EEC and the low voltage directive 73/23/EEC (applicable to only the battery charger).

2.2 OUTSIDE PLANT SINGLE-MODE FIBER TERMINATION HARDWARE

- A. Manufacturer List:
 1. Corning Cable Systems iLID Series Splicing Device
 2. Panduit Corp.
 3. Leviton
 4. Or Approved Equal
- B. Description:
 1. High precision Zirconia Ceramic ferrule connectors.
 2. Insertion loss – 0.1 dB typical/0.5 dB maximum per connector pair for multimode, 0.2 dB typical/0.5 dB maximum per connector pair for single –mode.
 3. Operating temperature -40° to +75°C
- C. Part numbers:
 1. Corning Cable Systems iLID Series Splicing Device
 2. Panduit Corp.
 3. Leviton
 4. Or Approved Equal

2.3 INBUILDING RIBBON FIBER TERMINATION HARDWARE

- A. Manufacturer List:
 1. Corning Cable Systems iLID Series Splicing Device
 2. Panduit Corp.
 3. Leviton
 4. Or Approved Equal
- B. Description:
 1. Splice on MTP connector.
 2. Non-pinned.
 3. Operating temperature -40° to +75°C

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

- A. Check actual site conditions prior to start of any work. Ensure all preceding trade work associated with the telecommunications system is accurate and complete before proceeding with installation or use of products specified in this section.
- B. Fusion Splicer Device:
 - 1. Process:
 - a. Follow manufacturer's instructions at all times when operating the optical fiber fusion splicing device. Pay particular attention to cleanliness and axis alignment.
 - b. The technician shall utilize the integrated tensile testing function of the splicing device after each splice to analyze the strength of the fiber joint. The tensile testing load shall be 1.5 N (0.34 lbf) and shall be applied for approximately one second. Any splice failing the tensile test shall be re-spliced immediately.
- C. Re-Installation Process:
 - 1. No additional burden to the City of New York regarding costs, network down-time and/or end user interruption shall result from the re-installation of specified components. Scheduling for re-installation work shall be coordinated, in writing, with the Commissioner prior to beginning the work.
- D. Closeout Activities Process:
 - 1. Contractor shall provide documentation of all telecommunications system components under this section utilized throughout the site for review and reference by the Commissioner.
 - 2. Contractor to submit all as-built drawings and any test documentation required prior to acceptance by the City of New York.

END OF SECTION 27 13 23.13

SECTION 27 15 13 - COMMUNICATIONS COPPER HORIZONTAL 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 RELATED SECTIONS

- A. 27 10 00 Structured Cabling

1.3 SUMMARY

- A. Provides specifications for 4-pair UTP copper horizontal workstation cabling to distribute network signals from telecommunications distribution spaces to workstation outlet locations.

1.4 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.5 INFORMATIONAL SUBMITTALS

- A. Product Data:
 - 1. Submit product data in accordance with DDC General Conditions and Section 27 10 00.
 - 2. Submit letter from manufacturer stating combustibility of submitted cable does not exceed 2900 BTU/lb.
- B. Shop Drawings:
 - 1. Submit shop drawings in accordance with DDC General Conditions and Section 27 10 00.

1.6 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.
- B. Qualifications – Manufacturer:
 - 1. Component manufactures shall be ISO 9001:2000 and offer products that are RoHS compliant.

PART 2 - GENERAL**2.1 FOUR PAIR CATEGORY 6 UTP CABLING****A. Manufacturer List:**

1. Hubbell Category 6 Solution
2. Belden Category 6 Solution
3. Berk-tek Category 6 Solution
4. Siemon Category 6 Solution
5. Or Approved Equal

B. Description

1. All Category 6 performance four (4) pair UTP cable shall consist of eight (8) twenty-four (24) gauge, or greater, thermoplastic insulated solid twisted conductors that utilize the industry standard color code designations.
2. Outer diameter of cable jacket shall not exceed .25 inch.
3. Cable weight shall not exceed 33lbs per 1000'
4. The performance criteria for four (4) pair UTP cable shall be above and beyond specific TIA 568-C standards for the particular cable's rating and shall show stable performance with documented electrical characterization out to 350 MHz.
5. Four (4) pair UTP cables must perform over and above each of the current specification parameters for the latest published shielded twisted pair, 1 Gb performance cable solution.
6. Four (4) pair UTP cables shall be a fluted design with a pair isolator/separator that supports voice, analog baseband video/audio, RS-232, RS422, RS-485, 100BASE-T Ethernet, 155 Mbps ATM, AES/EBU digital audio, 270 Mbps digital video, and emerging high-bandwidth applications, including 1 Gb Ethernet for category 6 cables, as well as all 77 channels (550 Mhz) of analog broadband video.
7. Cables shall be rated per the installation environment as required.
8. Select an appropriate cable construction, including external jacket properties, when installing cables in aerial, outdoor, underground and corrosive environments.

C. Accessory Products:

1. Provide any accessory products related to the UTP copper 4-pair cabling required to provide a complete and functional infrastructure system.

2.2 FOUR PAIR AUGMENTED CATEGORY 6A UTP CABLING**A. Manufacturer List:**

1. Hubbell Category 6A Solution
2. Belden Category 6A Solution
3. Berk-tek Category 6A Solution
4. Siemon Category 6A Solution
5. Or Approved Equal



B. Description

1. Augmented category-6 performance four (4) pair UTP cable shall consist of eight (8) twenty-two (22) gauge, or greater, thermoplastic insulated solid twisted conductors that utilize the industry standard color code designations.
2. The performance criteria for four (4) pair UTP cable shall be above and beyond specific TIA-568-C standards for the particular cable's rating and shall show stable performance with documented electrical characterization out to 625 MHz.
3. Four (4) pair UTP cables must perform over and above each of the current specification parameters for the latest published unshielded twisted pair, 10 Gb performance cable solution.
4. Four (4) pair UTP cables shall be a four twisted pairs of 22-gauge insulated copper conductors surrounded by a tight inner jacket and a co-extruded air-chambered outer jacket. Cable construction also includes a pair divider along the cable center. Cable design shall support voice, analog baseband video/audio, RS-232, RS422, RS-485, 100BASE-TX Ethernet, 155 Mbps ATM, AES/EBU digital audio, 270 Mbps digital video, and emerging high-bandwidth applications, including 1 Gb Ethernet and 10Gb Ethernet for Category-6a cables, as well as all 77 channels (250 Mhz) of analog broadband video.
5. Cables shall be rated per the installation environment as required.
6. Select an appropriate cable construction, including external jacket properties, when installing cables in aerial, outdoor, underground and corrosive environments.

- C. Provide any accessory products related to the UTP copper 4-pair cabling required to provide a complete and functional infrastructure system.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

- A. Check actual site conditions prior to start of any work. Ensure all preceding trade work associated with the telecommunications system is accurate and complete before proceeding with installation or use of products specified in this section. Examples of work which must be checked include, but are not limited to.
- B. Examine and compare the telecommunications drawings and specifications with the drawings and specifications of other trades. Report any discrepancies between them to the Commissioner and obtain written instructions for changes or revisions.
- C. Adequate clearances of doors, riser spaces and ceilings for all component of the telecommunications system.
- D. Electrical requirements (conduit installation and capacity).

3.3 FOUR PAIR UTP CABLING INSTALLATION

- A. Install all horizontal station cabling per the manufacturer's recommended installation instructions, under the guidelines of TIA-568-C and BICSI, and in quantities indicated in the TT-series drawings.
- B. Install cable with the appropriate sheath construction (PVC, Riser rated, Plenum rated) for the environment in which they are installed so that they meet manufacturer's requirements.
- C. Install all cables with proper attention paid to bend radii, pulling method, attachment method, and pulling forces. All cable shall be pulled using an appropriate measuring device to ensure that the specified force is not exceeded as noted in BICSI guidelines. Also refer to the cable manufacturer's specifications for exact cable requirements per the particular cable type.
- D. All cables shall be visually inspected for insufficient bend radius during and after pulling. Damaged cables, or those installed under questionable methods and/or circumstances shall be replaced at no additional cost to the City of New York.
- E. Contractor shall ensure that all TIA and industry standards are met with special regards to maximum stripping length of cable jackets. No four (4) pair UTP cables shall have more than three-eighth inch (3/8") of cable jacket removed beyond the termination points.
- F. Install the horizontal cabling with attention paid to aesthetic means and methods when routing cabling within IT spaces.
- G. All cabling distributed horizontally through metal stud framing must have plastic protective bushings inserted to protect cables prior to installation.
- H. All cables shall be clearly labeled on both ends and in an accessible location no more than six inches (0'-6") feet from the cable ends.
- I. The City of New York reserves the right to specify a new location for any outlet or equipment without cost.

END OF SECTION 27 15 13

SECTION 27 15 43 - COMMUNICATIONS FACEPLATES AND CONNECTORS

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 RELATED SECTION

- A. 27 10 00 Structured Cabling

1.3 SUMMARY

- A. Provides specifications for horizontal workstation cable termination components and outlet housing component. Includes wall-mount, floor-mount, and ceiling-mount components to support the various workstation outlets throughout the cabling plant

1.4 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.5 ACTION SUBMITTALS

- A. Product Data:
 - 1. Submit all product data in accordance with DDC General Conditions and Section 27 10 00.
- B. As-Built Drawings:
 - 1. Submit all as-built drawings in accordance with the requirements of Section 27 10 00.

1.6 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.

1.7 CLOSEOUT SUBMITTALS



A. As-Built Drawings:

1. Submit all as-built drawings in accordance with the requirements of Section 27 10 00.
2. Final project labeling scheme documentation clearly indicating the City of New York approved labeling scheme for all components of the communications system.

PART 2 - PRODUCTS

2.1 UTP CONNECTORS

A. Manufacturer List:

1. Belden Category 6 Connectors
2. Leviton Category 6 Connectors
3. Hubbell Category 6 Connectors
4. Siemon Category 6 Connectors
5. Or Approved Equal

B. Description:

1. UTP connectors shall be rated to perform at or above current TIA performance specified for horizontal copper cable specified (27 15 13).
2. UTP connectors shall have an eight (8) position, eight (8)-conductor module that accepts both RJ-45 and RJ-11 modular plugs. Performance of the outlet connector shall not be decreased with an RJ-11 modular plug at any time.
3. When utilized as part of a channel or permanent link, all high performance modular outlet connectors shall not decrease the horizontal cable elevated performance transmission requirements before and after installation as specified in TIA-568-C.1 Commercial Building Telecommunications Cabling Standard (horizontal cable section) in all noted performance parameters.
4. All UTP connectors shall be provided in a color that matches the electrical trim color unless otherwise noted in the TT-series drawing.

C. Accessory Products:

1. Provide any accessory products related to the UTP connectors required to provide a complete and functional infrastructure system.

D. Manufacturer List:

1. Belden Category 6A Connectors
2. Leviton Category 6A Connectors
3. Hubbell Category 6A Connectors
4. Siemon Category 6A Connectors
5. Or Approved Equal



E. Description:

1. UTP connectors shall be rated to perform at or above current TIA performance specified for horizontal copper cable specified (27 15 13).
2. UTP connectors shall have an eight (8) position, eight (8)-conductor module that accepts both RJ-45 and RJ-11 modular plugs. Performance of the outlet connector shall not be decreased with an RJ-11 modular plug at any time.
3. When utilized as part of a channel or permanent link, all high performance modular outlet connectors shall not decrease the horizontal cable elevated performance transmission requirements before and after installation as specified in TIA-568-C.1 Commercial Building Telecommunications Cabling Standard (horizontal cable section) in all noted performance parameters.
4. All UTP connectors shall be provided in a color that matches the electrical trim color unless otherwise noted in the TT-series drawing.

F. Accessory Products:

1. Provide any accessory products related to the UTP connectors required to provide a complete and functional infrastructure system.

2.2 OUTLET HOUSING COMPONENTS

A. Manufacturer List:

1. Belden Category 6 Connectors
2. Leviton Category 6 Connectors
3. Hubbell Category 6 Connectors
4. Simon Category 6 Connectors
5. Or Approved Equal

B. Description:

1. All outlet housings at the various technology outlet locations shall provide the designated number modular insert ports as indicated in the TT-series drawings.
2. All flush-mounted faceplates shall be available in one (1), two (2), three (3), four (4), six (6) port configurations of the same single gang style outlet and eight (8) port configurations of the same double gang style outlet.
3. When utilized as part of a channel or permanent link, all high performance modular outlet connectors shall not decrease the horizontal cable elevated performance transmission requirements before and after installation as specified in TIA-568-C.1 Commercial Building Telecommunications Cabling Standard (horizontal cable section) in all noted performance parameters.
4. All UTP connectors shall be provided in a color that matches the electrical trim color unless otherwise noted in the TT-series drawings.



C. Accessory Products:

1. Provide any accessory products related to the workstation outlet housing components required to provide a complete and functional infrastructure system.

2.3 F- TYPE COUPLERS

A. Manufacturer List:

1. Hubbell
2. Belden
3. Leviton
4. Or Approved Equal

B. Description:

1. All F-type coaxial couplers shall be manufactured by the same manufacturer of the workstation outlet housing and UTP connectors.
2. All modular outlet coaxial coupler shall not limit the functionality or performance of the radio grade cable or connector when installed at each workstation outlet location.
3. Ensure couple size and type is compatible with the specified RG-6 cable and workstation outlet housing at each outlet location/type.

C. Accessory Products:

1. Provide any accessory products related to the workstation outlet F-type coupler components required to provide a complete and functional infrastructure system.

2.4 F- TYPE COMPRESSION CONNECTORS

A. Manufacturer List:

1. Hubbell
2. Belden
3. Leviton
4. Or Approved Equal

B. Description:

1. All F-type coaxial connectors shall be of on manufacturer.
2. F-type connectors shall be compression type only, crimp connectors are not acceptable.
3. Prepare Coaxial cable in accordance with installation instructions for connector.
4. Installation of compression connect onto RG-6 cable shall allow sufficient space once cable is connected to F-coupler, F-coupler is installed onto faceplate, and faceplate is installed onto



back box so that maximum bend radius of coaxial cable is no exceed once the outlet assembly is installed. Refer to manufacturer of coaxial cable for maximum coaxial cable bend radius.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

- A. Check actual site conditions prior to start of any work. Ensure all preceding trade work associated with the telecommunications system is accurate and complete before proceeding with installation or use of products specified in this section.
- B. Confirm all housings including back boxes, floor boxes and poke-throughs provided for the telecommunications connectivity system will support the installation of project approved manufacturer.

3.3 UTP CONNECTORS

- A. Process:
 - 1. Install all connectors under the guidelines of the manufacturers' recommended instructions and per all TIA-568-C standards, BICSI guidelines, and manufacturer approved industry practices.
 - 2. The installation and performance parameters of all installed couplers and connectors shall be verified by the trade contractor through TIA-568-C testing procedures.
 - 3. Color of all UTP connectors shall be coordinated with the City of New York before purchase and installation.

3.4 OUTLET HOUSINGS

- A. Process:
 - 1. Color of outlet housing components shall be coordinated with the Commissioner before purchase and installation.
 - 2. All technology outlets located on walls shall be flush mounted, level and plumb.
 - 3. All technology outlets shall be mounted at right angles and parallel to the floor, unless installation requirements or design dictate otherwise.



4. Install blank inserts in outlet housing spaces that are not being filled with cable termination modules. Black inserts shall match the workstation housing color, unless otherwise indicated in the TT-series drawings.
5. All outlets located in systems furniture may be served from a wall adjacent to the furniture cluster or a floor box. If the cable is exposed prior to entering furniture raceway, install spiral wrap tubing to protect the cable per the manufacturer's recommendations.
6. All outlet housings as well as each individual utilized port must be labeled in accordance with the City of New York approved labeling scheme.

3.5 F-TYPE COUPLERS

A. Process:

1. Install couplers under the guidelines of the manufacturers' recommended instructions and per all TIA-568-C standards, BICSI guidelines, and manufacturer approved industry practices.
2. The installation and performance parameters of all installed couplers and connectors shall be verified by the trade contractor through TIA-568-C testing procedures.
3. Color of all F-type couplers shall be coordinated with the City of New York before purchase and installation.

3.6 F-TYPE CONNECTORS

A. Process:

1. Install connectors following manufacturers' recommended instructions and per all TIA-568-C standards, BICSI guidelines, and manufacturer approved industry practices.

END OF SECTION 27 15 43

SECTION 27 16 19 - COMMUNICATIONS PATCH CORDS

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. Provides specifications for 4-pair UTP copper patch cables.

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 ACTION SUBMITTALS

- A. Product Data:
 - 1. Submit all product data in accordance with DDC General Conditions and Section 27 10 00.
 - 2. Provide horizontal and riser cable termination schedules in Microsoft Excel format six (6) weeks in advance of schedule date for patch cord installation so that the Commissioner may complete patch cord installation schedules.
- B. As-Built Drawings:
 - 1. Submit all as-built drawings in accordance with the requirements of Section 27 10 00.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements"
- B. Component manufacturer shall be ISO 9001:2000 and offer products that are RoHS compliant.

1.6 CLOSEOUT SUBMITTALS

- A. As-Built Drawings:
 - 1. Submit all as-built drawings in accordance with the requirements of Section 27 10 00.
 - 2. Shop drawings shall include evidence of cabinets, racks, and enclosures have been coordinated with field conditions and the work of other trades.



3. This submittal may have a written component and a visual component for review and action by the Commissioner prior to installation.

PART 2 - PRODUCTS

2.1 CATEGORY 6A RATED 8 PIN MODULAR UTP PATCH CORDS (WIRELESS OUTLETS)

A. Manufacturer List:

1. Subject to compliance with requirements: Same manufacturer as copper horizontal UTP cable (27 15 13)

B. Requirements:

1. Physical Specifications: 4-pair, 23 AWG or 24 AWG stranded copper UTP cable, with male 8-pin modular plugs with insert-molded strain relief on both ends.
2. Performance Characteristics: Meet or exceed the TIA Augmented Category 6 channel specifications.
3. Support the following applications: IEEE 802.3 1000Base-T (Gigabit Ethernet), IEEE 802.3 10GBase-T, TIA-854 1000Base-TX, ATM CB1G.
4. Patch cords must have an outer sheath rated for the environment that it is installed in; riser rated when passing through floors, plenum rated when installed within an air plenum.
5. All patch cords supplied must comply with TIA-568-C.2-10, Production Modular Cord NEXT Loss Test Method, and Requirements for UTP Cabling.
6. All patch cords shall be snagless design.
7. Available colors must include Blue, yellow, green, black, gray, white, purple, and red. Color will be selected during submittal process.

C. Patch Cord Quantities:

1. One patch cord per terminated jack (both outlet end and IDF room end) as indicated on the TT drawings for each wireless access point outlet indicated on the drawings. (for example for 1 wireless access point outlet with 3 horizontal 6a cables – provide 2 patch cords)
2. Provide patch cords in the following lengths:
 - a. 5% of total wireless access point outlet quantity – 3' cords
 - b. 5% of total wireless access point outlet quantity – 5' cords
 - c. 70% of total wireless access point outlet quantity – 7' cords
 - d. 10% of total wireless access point outlet quantity – 9' cords
 - e. 10% of total wireless access point outlet quantity – 15' cords

2.2 CATEGORY 6 RATED 8 PIN MODULAR UTP PATCH CORDS (ALL OTHER OUTLETS)

A. Manufacturer List:

1. Subject to compliance with requirements: Same manufacturer as copper horizontal UTP cable (27 15 13)

B. Requirements:

1. Physical Specifications: 4-pair, 23 AWG or 24 AWG stranded copper UTP cable, with male 8-pin modular plugs with insert-molded strain relief on both ends.



2. Performance Characteristics: Meet or exceed the TIA Category 6 channel specifications.
 3. Support the following applications: IEEE 802.3 1000Base-T (Gigabit Ethernet), IEEE 802.3, TIA-854 1000Base-TX, ATM CB1G.
 4. Patch cords must have an outer sheath rated for the environment that it is installed in; riser rated when passing through floors, plenum rated when installed within an air plenum.
 5. All patch cords supplied must comply with TIA-568-C.2-10, Production Modular Cord NEXT Loss Test Method, and Requirements for UTP Cabling.
 6. All patch cords shall be snagless design.
 7. Available colors must include Blue, yellow, green, black, gray, white, purple, and red. Color will be selected during submittal process.
- C. Patch Cord Quantities:
1. One patch cord per terminated jack (both outlet end and IDF room end) as indicated on the TT drawings for each JACK indicated on the drawings. (for example a standard outlet with 2 category 6 cables provide 4 patch cords)
 2. Provide patch cords in the following lengths:
 - a. 5% of total wireless access point outlet quantity – 3' cords
 - b. 5% of total wireless access point outlet quantity – 5' cords
 - c. 70% of total wireless access point outlet quantity – 7' cords
 - d. 10% of total wireless access point outlet quantity – 9' cords
 - e. 10% of total wireless access point outlet quantity – 15' cords

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. Install patch cords using horizontal and vertical cable management systems indicated on drawings.
- B. Install patch cords using lengths that minimize slack, where possible route patch cords so that slack does not exist.
- C. Route Patch cords from angled patch panel into vertical cable management located on same side of rack as patch panel port.
- D. Install patch cords using City of New York provided patch installation schedule.
- E. Split installation of patch cords into switch so that 50 percent and 50 percent of patch cords connecting to switch ports (ports on right side of switch) route from switch port to vertical cable management on right side of rack.



3.3 CLOSEOUT ACTIVITIES:

- A. Contractor shall provide documentation of all telecommunications system components under this section utilized throughout the site for review and reference by the Commissioner.
- B. Contractor to submit all as-built drawings and any test documentation required prior to acceptance by the Commissioner.

END OF SECTION 27 16 19

SECTION 27 41 16 - INTEGRATED AUDIOVISUAL 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, and (4) the Contract (City of New York Standard Construction Contract).

1.2 SUMMARY

- A. It is the intent of these specifications to provide a complete working audio visual system ready for the City of New York's use. System acceptance will be judged on the successful adherence to the installation instructions of this Specification.
- B. Any given item type of equipment or material must be the product of one manufacturer throughout the facility. Multiple manufacturers of any one item will not be permitted, unless specifically noted otherwise.
- C. Provide audio visual devices and equipment with performance levels and capacities as noted herein.

1.3 RELATED SECTIONS

- A. Section 26 05 00 – Common Work Results for Electrical
- B. Section 27 05 26 – Grounding and Bonding for Communications Systems
- C. Refer to the following Sections for specifications for the Data Network:
 - 1. Section 27 21 00 – Data Communications
 - 2. Section 27 21 12 – Data Communications Network Security Appliances
 - 3. Section 27 21 26 – Data Communications Network Management
 - 4. Section 27 21 29 – Data Communications Switches
- D. Refer to the following standards for performance verification related to the Work:
 - 1. AVIXA 10-201X, AV Systems Performance Verification

1.4 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”

1.5 SCOPE OF WORK

- A. Provide audio visual systems design, engineering, and installation within all phases and spaces of the Project. Systems are to include all devices, equipment, installation, programming and commissioning in accordance with requirements of the contract documents and drawings.



1. The Work detailed within the Contract Documents has been specified to meet certain requirements for performance, appearance, and costs. It will be the responsibility of the Contractor to implement the guidelines and requirements contained in the Contract Documents and translate them into a complete design package containing all elements necessary for a complete, operational, and functionally integrated Audio Visual System(s).
2. Provide all work as detailed in the Contract Documents as a turnkey installation including all material, labor, engineering, warranties, taxes, freight, and permits. Only items and requirements specifically stated to be provided by others will not be a requirement for this Section of the Work.

1.6 APPLICABLE CODES, STANDARDS, PERMITS AND INSPECTIONS

- A. All audiovisual work must meet or exceed the latest requirements of the City of New York over the audiovisual work and the project. It will be the responsibility of the Contractor to obtain copies of all applicable codes.
- B. Any portion of the audiovisual work not subject to the requirements of an electrical code will be governed by the National Electrical Code and any and all applicable sections of the National Fire code, as published by the National Fire Protection Association.
- C. Installation procedures, methods and conditions must be in compliance with the latest requirements of the Federal Occupational Safety and Health Administration (OSHA), the Americans with Disabilities Act (ADA) and the Architectural Barriers Act (ABA).
- D. The Contractor is responsible for all costs incurred to meet these codes and conditions.
- E. Additional codes and requirements pertaining to the work:
 1. NFPA-72 National Fire Alarm and Signaling Code
 2. International and National Electric Codes (IEC/ NEC)
 3. IEC 60268-16 Third Edition 2003-05 Objective rating of speech intelligibility
 4. ANSI/Infocomm
 - a. 1M:2009 Audio Coverage Uniformity Standard in Enclosed Listener Areas
 - b. 2M:2010 Standard Guide for Audiovisual Systems Design and Coordination
 - c. 3M:2011 Projected Image System Contrast Ratio
 - d. X3T9.5 FDDI
 - e. X3T9.5 CDDI
 - f. Society of Motion Picture and Television Engineers (SMPTE)
 - g. Building Industry Consulting Service International (BICSI) Telecommunications Distribution Methods Manual - latest edition.
 - h. ANSI/TIA/EIA-568-B - Commercial Building Telecommunications Cabling Standard
 - i. ANSI/TIA/EIA-569 - Commercial Building Standards for Telecommunications Pathways and Spaces
 - j. ANSI/TIA/EIA-606-A. Administration Standard for Commercial Telecommunications Infrastructure



- k. ANSI J-STD-607-A, Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications
- l. EIA RS-232 Serial Communications Electrical Interface
- m. EIA RS-310-C Racks, Panels and Associated Equipment
- n. FCC Part 15
- o. FCC Part 68
- p. IEEE 802.3
- q. IEEE 802.5 NFPA 70 National Electrical Code
- r. Article 770 Optical Fiber Cables
- s. Article 800 Communications Circuits
- t. NFPA 75 Protection of Electronic Computer / Data Processing Equipment

PART 2 - PRODUCTS

2.1 QUALITY OF MATERIALS AND EQUIPMENT

- A. All materials and equipment supplied by the Contractor must be new and must meet or exceed the latest published specification of the manufacturer in all respects.
- B. The Contractor must supply the latest model available at the time of order placement for each piece of equipment.
- C. All equipment will be UL listed, or equivalent.
- D. The Contractor must also have personnel on staff and available to work on this project with the following Certifications:
 - 1. Cisco CCNA – Routing & Switching
 - 2. Microsoft MCSE - Productivity
 - 3. Cisco CCNA – Wireless
 - 4. Microsoft MCSE - Mobility
 - 5. AVIXA – CTS-I
 - 6. AVIXA – CTS-D

2.2 FUNCTIONAL NARRATIVES

- A. Community Room
 - 1. Summary
 - a. The Community Room will be a Multipurpose Room that will be available for presentation and events at the Library.
 - b. The main display for the Community Room will be a large projection screen at the front of the room. A ceiling mounted video projector will project PC and video images in 4K resolution onto the screen.
 - c. A Presenter location will be available at the left side of the room. A wall plate connection will be



available for the Presenter to plug in their laptop PC. Another wall plate laptop PC connection will be available at the side wall.

- d. A full function audio system will be provided for the Community Room. Wall mounted speakers will play back program audio. Ceiling recessed speakers will play back conferencing audio from the far end and provide voice reinforcement for the Presenter. An Induction Loop System will be used for Assistive Listening for the Hearing Impaired. Wireless microphones will be available for voice reinforcement for the Presenter and audience. A ceiling array microphone will pick up audio from the audience area for the conferencing systems.
 - e. A wall mounted touch panel at the front of the room will be available for audiovisual system control.
 - f. All equipment for the Community Room audio visual system will be housed inside equipment racks in the AV Cabinet located in the corner of the room.
2. System Interconnection & Functional Description
- a. The functional interconnections of the audio, video and control systems will be as detailed on drawing #TA-501.
 - b. The Contractor will provide all interconnection cable, connectors, terminal strips, wireways, flexible conduit, etc., to facilitate the audiovisual systems as detailed within these specifications and drawings.
 - c. The conduit and power systems are detailed in the Electrical drawings.
3. Display and Video
- a. Provide and integrate projectors, switching, video distribution equipment, interfaces and cabling as detailed on the drawings and as described in this specification.
 - b. Provide, install and integrate an all-in-one HDBaseT based presentation switcher/router to allow selected video sources to pass to the video projector. Provide, install and integrate all required transmitter/receiver devices (at display and wall locations) to operate in tandem with the switcher/router. This switcher will include audio routing, video routing, and a control processor.
 - 1). Presentation Switcher

Basis-of-Design Product: Subject to compliance with requirements, provide a Presentation Switcher Crestron DMPS3-4K-350-C or a comparable product by one of the following:

 - a). Extron
 - b). AMX
 - c). Or approved equal
 - c. Provide and install a 4K resolution (3840x2160) laser-based data video projector, complete with zoom lens, and all necessary ceiling mounting hardware for display of high definition and standard definition video and PC images.
 - 1). 5,000 Lumen, 4K UHD, DLP, Laser Projector

Basis-of-Design Product: Subject to compliance with requirements, provide a video projector Canon LX-MH502Z or a comparable product by one of the following:

 - a). NEC
 - b). Digital Projection



- c). Or approved equal
 - 2). Universal Ceiling Mount for Video Projector, 9-12" Adjustable Extension Column, 4" Ceiling Plate

Basis-of-Design Product: Subject to compliance with requirements, provide a Ceiling Mount for Video Projector Chief RPAU, CMS009012, and CMA105 or comparable product(s) by one of the following:
 - a). Peerless
 - b). Premier Mounts
 - c). Or approved equal
 - d. Video source devices
 - 1). Laptop PC (OFE) images from wall mounted HDBaseT transmitters at the front wall near the Presenter location and at the side wall.

Basis-of-Design Product: Subject to compliance with requirements, provide a wall mounted HDBaseT transmitter Crestron DM-TX-4K-100-C-1G or a comparable product by one of the following:
 - a). Extron
 - b). AMX
 - c). Or approved equal
 - 2). PC images from an OFE desktop PC with an HDMI output.
 - 3). Images from wireless devices including but not limited to wireless laptop PCs, tablets, smart phones and other devices via the wireless collaboration device.

Basis-of-Design Product: Subject to compliance with requirements, provide a Wireless Video Gateway Mersive Solstice POD or a comparable product by one of the following:
 - a). Crestron
 - b). Extron
 - c). Or approved equal
 - 4). Rack mounted auxiliary panel for connection of external HDMI sources.
4. Audio
- a. Provide and integrate speakers, amplifiers, microphones, audio digital signal processing, and cabling as described in this specification.
 - 1). Audio Amplifier

Basis-of-Design Product: Subject to compliance with requirements, provide an Audio Amplifier Labgruppen LUCIA 120/1-70 or a comparable product by one of the following:
 - a). JBL
 - b). Extron
 - c). Or approved equal
 - b. Provide and install wall mounted speakers for playback of program audio.
 - 1.) Loudspeaker - 8" Dual Concentric Full Range Loudspeaker



Basis-of-Design Product: Subject to compliance with requirements, provide 8” Full Range Loudspeakers Tannoy VX 8 or a comparable product by one of the following:

- a). JBL
 - b). Biamp
 - c). Or approved equal
- c. Provide and install ceiling recessed speakers for playback of conferencing audio and voice reinforcement from the wireless microphone systems.
- 1). Loudspeaker - Ceiling Recessed 8", w/transformer

Basis-of-Design Product: Subject to compliance with requirements, provide Ceiling Recessed 8” speakers Tannoy CMS 803DC Q or a comparable product by one of the following:

- a). JBL
 - b). Biamp
 - c). Or approved equal
- d. Provide an audio digital signal processing system for audio matrix routing and distribution, signal processing, and equalization.
- 1). Audio DSP

Basis-of-Design Product: Subject to compliance with requirements, provide an audio digital signal processing system Symetrix Radius NX 12x8 or a comparable product by one of the following:

- a). Biamp
 - b). ClearOne
 - c). Or approved equal
- e. Provide a SIP standard VoIP Telephone Hybrid Interface card for use with the audio teleconferencing system.
- 1). Audio DSP - Input Card Telephone VoIP 2ch.

Basis-of-Design Product: Subject to compliance with requirements, provide an VoIP Telephone Hybrid card Symetrix 2 Line VoIP Interface Card or a comparable product by one of the following:

- a). Biamp
 - b). ClearOne
 - c). Or approved equal
- f. Provide a wireless microphone system, complete with wireless handheld and lavalier transmitters and receivers, directional antenna and antenna distribution system for use with the voice reinforcement and conferencing systems.

Basis-of-Design Product: Subject to compliance with requirements, provide a wireless microphone system from the following:

- 1). Wireless Mic - Receiver 4ch.: Shure ULX4Q
- 2). Wireless Mic - Handheld Tx Beta58: Shure ULXD2/B58
- 3). Wireless Mic - Bodypack Tx: Shure ULXD1
- 4). Wireless Mic - Mini Lavalier, Cardioid: Shure MX150/C
- 5). Wireless Mic - Battery Charger 2-bay: Shure SBC210



- 6) Wireless Mic – Battery: Shure SB900

or comparable product(s) by one of the following:

- a) Sennheiser
 - b). AKG
 - c). Or approved equal
- g. Provide a ceiling recessed microphone array for speech pick up and voice reinforcement from the conferencing participants in the audience area for the audio conferences.
- 1). Microphone - Ceiling-Mount, 2'x2' Grid w/ DANTE
Basis-of-Design Product: Subject to compliance with requirements, provide a 2'x2' ceiling microphone Shure MXA910 or a comparable product by one of the following:
 - a). Biamp
 - b). ClearOne
 - c). Or approved equal
 - h. Provide and install a complete Induction Loop based Assistive Listening System. Provide all equipment and components of the Induction Loop based system including but not limited to:
 - 1). Hearing Loop Driver
 - 2). Copper Flat Wire
 - 3). Smart Stripe vinyl floor tape
 - 4). Hearing Loop Signage
5. Control
- a. Provide audiovisual system control from a wall mounted 10" LCD touch panel. 1).Control Touch Panel - Wired 10"
Basis-of-Design Product: Subject to compliance with requirements, provide a 10" Control Touch Panel Crestron TSW-1070 or a comparable product by one of the following:
 - a). Extron
 - b). AMX
 - c). Or approved equal
 - b. Establish control system functionality for the following devices and capabilities for the Community Room:
 - 1). Video Projector
 - 2). Projection Screen
 - 3). Audiovisual Source Selection
 - 4). Audio Conferencing dial
 - 5). Program Volume Control
 - 6). Speech Volume Control
 - 7). Far End Volume Control
 - 8). Audio Mute
 - 9). Light Scene Selection



- c. Provide remote control of systems with an integrated network-based master controller that provides ports for IR/serial, RS-232/422/485, Ethernet, relay closures and input and output control card frames and rack mounted, as indicated on the drawings and in this specification. Master controller must be part of the all-in-one HDBaseT presentation switcher/router.
 - d. Provide control of all equipment as indicated within this specification and as indicated on drawings.
 - e. Provide all loose cables, connectors, etc. required to complete a full working system.
- 6. User Interface
 - a. Provide programming of control interfaces. Programming is to provide simple user interface to select local audio sources and adjust room volume levels to within predetermined limits throughout the Stretching Room.
 - b. Provide control panel operations that are consistent from page to page.
 - c. Provide control panel operations that are consistent from room to room and/or station to station.
 - d. Provide feedback that indicates the current equipment and/or system status where possible.
- 7. Software
 - a. Provide control capability for every function available on every piece of equipment being controlled by the system. Define and provide “macro” commands for the most used functions.
 - b. Provide password protection for any operations that can adversely affect certain room set-up functions. Provide for the ability for remote monitoring of system functions and adjustments via TCP/IP. Capability for configuration will require password protection for use of facility management. Provide for the delivery of email fault alerts to facility management.
- 8. Miscellaneous
 - a. Provide and install all hardware, cabling, connectors, faceplates, terminators, adapters, audio combiners, balanced-unbalanced audio converters, wall boxes, etc. required to ensure installation of a fully functional audiovisual system as depicted in the attached AV Systems drawings.
- 9. Equipment Layout
 - a. The equipment in this area will be as detailed on drawings.
 - b. The equipment for the Community Room audiovisual system will be located inside the audiovisual equipment racks in the AV Cabinet.
 - 1). Equipment Rack

Basis-of-Design Product: Subject to compliance with requirements, provide an Equipment Rack Middle Atlantic CFR-12-18 or a comparable product by one of the following:

 - a). Lowell
 - b). Tripp Lite
 - c). Or approved equal

2.3 AUDIOVISUAL EQUIPMENT SCHEDULE

- A. See 3.2 Audiovisual Equipment Schedule, below, detailed equipment lists for the audiovisual systems for Basis- of-Design products. Additional manufacturers and approved equal are included in Article 2.2.



PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 AUDIOVISUAL EQUIPMENT SCHEDULE

NYPL Hamilton Fish Park Renovation			
Community Room #108			
	DESCRIPTION	MFR (BOD)	MODEL
VIDEO PROJECTORS			
	5,000 Lumen, 4K UHD, DLP, Laser Projector	Canon	LX-MH502Z
	Universal Ceiling Mount for Video Projector	Chief	RPAU
	9-12" Adjustable Extension Column	Chief	CMS009012
	4" Ceiling Plate	Chief	CMA105
	AV Receiver - 4K Scaler	Crestron	DM-RMC-4KZ-SCALER-C
PROJECTION SCREENS			
	Projection Screen - 16:9 Motorized, 133" Diag (116"Wx65"H)	Da-Lite	Tensioned Advantage Electrol
VIDEO SOURCES			
	Host PC	OFE	OFE
	Wireless Video Gateway	Mersive	Solstice POD
	AV Transmitter - HDMI wallplate	Crestron	DM-TX-4K-100-C-1G
VIDEO SWITCHING & DISTRIBUTION SYSTEM			
	Presentation Switcher	Crestron	DMPS3-4K-350-C



AUDIO PROCESSING & DISTRIBUTION SYSTEM			
	Audio DSP - 12x8, 16 AEC in w/ Dante USB	Symetrix	Radius NX 12x8
	Audio DSP - Input Card Telephone VoIP 2ch.	Symetrix	2 Line VoIP Interface Card
	Audio Amplifier - 2ch. 60wpc Low-Z	Labgruppen	LUCIA 120/2
	Audio Amplifier - 1ch. 120wpc 70V	Labgruppen	LUCIA 120/1-70
	Complete Induction Loop Assistive Listening System, including:	Contacta	Quote #70-2098
	Hearing Loop Driver with rack mount ears	Contacta	V15a-RME
	18awg copper flat wire, .25" wide, 250ft,	Contacta	FW-18-250
	2" Smart Stripe vinyl floor tape, 130ft roll, Blue	Contacta	FT-SS-BLUE-2
	1/2" double sided adhesive tape, 164ft roll	Contacta	ADH-1/2-164ft
	Loop Listener	Contacta	RX20-HS
	8x10 Large Hearing Loop Sign (Size 10" X 8")	Contacta	HL Sign 8x10
	Dante Network Switch, 8 port	Yamaha	SWP1-8
	Loudspeaker - 8" Dual Concentric Full Range Loudspeaker	Tannoy	VX 8
	Loudspeaker - Ceiling Recessed 8", w/transformer	Tannoy	CMS 803DC Q
WIRED MICROPHONES			
	Microphone - Ceiling-Mount, 2'x2' Grid w/ DANTE	Shure	MXA910



WIRELESS MIC SYSTEM			
	Wireless Mic - Receiver 4ch.	Shure	ULX4Q
	Wireless Mic - Handheld Tx Beta58	Shure	ULXD2/B58
	Wireless Mic - Bodypack Tx	Shure	ULXD1
	Wireless Mic - Mini Lavalier, Cardioid	Shure	MX150/C
	Wireless Mic - Battery Charger 2-bay	Shure	SBC210
	Wireless Mic - Battery	Shure	SB900
CONTROL SYSTEM			
	Network Switch - 5-Port Gigabit Ethernet PoE	Crestron	CEN-SW-POE-5
	Control Touch Panel - Wired 10"	Crestron	TSW-1070
MISC. EQUIPMENT & SYSTEMS			
	Equipment Rack - Credenza 12RU, 18"D	Middle Atlantic	CFR-12-18
	Surge Suppressor/Power Distribution/Sequencer, 1RU	SurgeX	SEQ-1U
	Equipment Rack - Rack Drawer, 3RU	Middle Atlantic	D3
	Wireless Keyboard & Mouse	Logitech	MX900
	Misc. Wire, Cables, Plates/Panels & Connectors	Custom	By AV Subcontractor

END OF SECTION 274116

THIS PAGE INTENTIONALLY LEFT BLANK



SECTION 280000 - 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 SUMMARY

- A. Work of this Division consists of Electronic Safety and Security and includes but is not limited to the following:
 - 1. Access Control
 - 2. Electronic Security Conductors and Cabling
 - 3. Access Control Field Devices
 - 4. Access Control Interfaces
 - 5. Video Management System
 - 6. Video Surveillance Field Devices
- B. Related Documents and Sections: Examine Contract Documents for requirements that directly affect or are affected by Work of this Section. A list of those Documents and Sections include, but is not limited to the following:
 - 1. 28 05 07 Power Sources for Electronic Safety and Security
 - 2. 28 10 00 Access Control
 - 3. 28 14 00 Access Control Hardware Devices
 - 4. 28 16 00 Access Control Interfaces
 - 5. 28 21 00 Surveillance Cameras
 - 6. 28 23 00 Video Management System

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"
- B. Installer Qualifications
 - 1. Work specified herein shall be the responsibility of a single Security Subcontractor. A minimum of Three years' experience in the fabrication, assembly, and installation of systems of similar complexity as specified herein.
 - 2. The Contractor shall have local in-house engineering and project management capabilities consistent with the requirements of the Work.
 - 3. The Contractor shall maintain, or establish and maintain, a fully staffed office including a service center capable of providing maintenance and service to the Project. The Contractor shall staff the service center with factory trained technicians and adequately



equip the office to provide emergency service within four (4) hours after being called, 24 hours per day.

4. The Contractor shall provide factory-certified technicians to install, test and maintain the Work. All installing personnel shall be licensed and certified by the systems manufacture for the products being installed.
5. The Contractor shall ensure compliance with, and have a thorough understanding of all contract conditions pertaining to this Project.
6. The Contractor shall maintain an inventory of spare parts and other items critical to system operation and as necessary to meet the emergency service requirements of this Project within the local service center.

C. Product Standards

1. All equipment and materials for contained herein shall be the products of recognized manufacturers and shall be new.
2. New equipment and materials shall:
 - a. Be Underwriters Laboratories, Inc. (UL.) listed and approved where specifically called for; or where normally subject to such UL labeling and/or listing services.
 - b. Be clearly labeled identifying make, model, and manufacturer.
 - c. Be without blemish or defect.
 - d. Be products that meet with the acceptance of the agency inspecting the security systems work.

1.5 REFERENCES

A. All work shall be in accordance with, but not limited to, the following:

1. The National Electrical Code
2. American National Standards Institute (ANSI)
3. National Electrical Manufacturers Association (NEMA)
4. Telecommunications Industries Association (TIA)
5. Electronic Industries Association (EIA)
6. Institute of Electrical & Electronics Consultants (IEEE)
7. Underwriters Laboratories (UL)
8. American Standards Association (ASA)
9. Federal Communications Commission (FCC)
10. Occupational Safety and Health Administration (OSHA)
11. American Society of Testing Material (ASTM)
12. Americans with Disabilities Act (ADA)

B. In the event of conflicts, the more stringent provisions shall apply.

1.6 WORK INCLUDED

A. The Work shall include installation and commissioning of the following:

1. Integrated Security Management System (SMS) consisting of:
 - a. Access Control and Alarm Monitoring
 - b. Video Surveillance
 - c. Fire Alarm Interface
2. Wire and cable to install all equipment as specified herein



3. Miscellaneous conduit and back boxes (not shown on the Documents as provided, but required for a complete installation)

1.7 DEFINITIONS

- A. Regardless of their usage in codes or other industry standards, certain words or phrases as used in the Documents for the Work, shall be understood to have the specific meanings as ascribed to them in the following list:
1. “Circuit” – Any specific run of circuitry.
 2. “Circuitry” – Any Work which consists of wires, cables, raceways, and/or specialty wiring method assemblies complete with associated junction boxes, pull boxes, outlet boxes, joints, couplings, splices, and connections except where limited to a lesser meaning by specific description.
 3. “Concealed” (as applied to circuitry) – Covered completely by building materials, except for penetrations (by boxes and fittings) to a level flush with the surface as necessitated by functional or specified accessibility requirements.
 4. “Exposed” (as applied to circuitry) – Not covered in any way by building materials.
 5. “Patch Panel” – A system of terminal blocks, patch cords, and backboards that facilitate administration of cross-connecting cables.
 6. “Raceway” – Any pipe, duct, extended enclosure, or conduit (as specified for a particular system) which is used to contain wires and which is of such nature as to require that the wires be installed by a pulling in procedure. Where the word “conduit” is used without specific reference to type, it shall be understood to mean “raceway”.
 7. “Relocate existing” – Remove existing item from present location. Reinstall, re-connect, and test existing item and make ready for use at new location as indicated.
 8. “Remove existing” – Remove existing item and return item to City of New York.
 9. “Replace” – Remove existing item and return item to City of New York. Provide new item as indicated.
 10. “Riser” – Shall refer to the portion of the installation that transmits between building floors or between security system rooms; also referred to as “Backbone Cabling”.
 11. “Security Closet” – The enclosed area or room specifically designated for the routing, termination, and/or cross connecting of security system cable to other security system cable and/or equipment.
 12. “Security system Wiring” – see “Circuitry”.
 13. “Security system Work” – See “Work”.
 14. “Standard” (as applied to wiring devices) – Not of a separately designated individual type.
 15. “Wiring” – See “Circuitry”.

1.8 GUARANTEE SERVICE

- A. The Work as specified herein, including all materials and labor, but excepting any existing devices and equipment which are incorporated in the completed Work, shall be warranted to be free from defects in design, workmanship, and materials. Further, the Contractor shall warrant that the completed systems, including all components (except those, which are existing or provided by others), are of sufficient size and capacity to fulfill the requirements of the Specifications.



- B. Guarantee Service:
1. In the event that defects in the materials and/or workmanship are identified during the guarantee period, the Contractor shall provide all labor and materials as may be required for prompt correction of the defect.
 2. During the guarantee period, the Contractor shall, upon receipt of a request for service from the Commissioner, deploy service personnel to the Commissioner premises within four hours to initiate corrective action.
 3. All guarantee service and repair work shall be performed by personnel, who have been trained, certified and is experienced in the operation and maintenance of the installed system(s).
 4. Guarantee service shall include the replacement of all parts and/or components as required to restore normal system operation. In the event that system parts or components must be removed for repair, it shall be the responsibility of the Contractor to furnish and install temporary parts and/or components as required to restore normal system operation until the repaired parts or components can be repaired and re-installed.
 5. It shall be the responsibility of the Contractor to maintain an inventory of spare parts or to arrange for manufacturer parts support as required ensuring correction of all critical component failures or malfunctions within 48 hours of the Commissioner's request for service. Critical parts shall be defined as those, which govern or affect the normal operation of more than one field device.
 6. Immediately following the completion of a guarantee repair or service call, the Contractor's service personnel shall submit a written report to the Commissioner which details the service work performed, the cause of the trouble, and any outstanding work which is required to restore complete and normal operation.
- C. The Contractor shall perform preventative maintenance during the guarantee period as part of the guarantee service. The Contractor shall submit a list of items to be included in the preventative maintenance program and the service to be performed.
- D. Provide written notice to the City of New York documenting any Work performed during the guarantee period, including any preventative maintenance Work performed.
- E. Provide on-line software maintenance and support during the guarantee period including all software and hardware.

1.9 SUBMITTALS

- A. Submit for approval, details of all materials, equipment, and systems to be furnished. Work shall not proceed without approval of the submitted items.
- B. General Description and Requirements
1. Submit pre-fabrication submittals in accordance with the construction schedule.
 2. Pre-fabrication submittals shall consist of product data, Shop Drawings, samples, and a detailed completion schedule. Partial submittals will not be accepted without prior written approval.
 3. No portion of the Work shall commence nor shall any equipment be procured until approval of the pre-fabrication submittals has been given in writing.



4. A letter of transmittal identifying the name of the Project, Contractor's name, and date submitted for review shall accompany pre-fabrication submittals along with a list of items transmitted.
- C. Product data required as part of the pre-fabrication submittal shall include the following:
1. Equipment schedules listing all system components, manufacturer, model number and the quantity of each
 2. General functional descriptions for each system
 3. Manufacturer's data specification sheets for all system components, including any guarantee information (sheets containing more than one device or component model number shall be clearly marked to delineate items included in the Work)
 4. A complete list of cable and wiring types, sizes, manufacturer, and model number
 5. A complete list of finishes and sample graphics, including custom art work and custom graphics (if applicable)
 6. List of parts inventory to provide manufacturer recommended service and maintenance of the Work
- D. Shop Drawings shall include the following:
1. Floor plan drawings indicating device locations with device legends
 2. System riser diagram with all devices, wire runs, and wire designations
 3. Schematic block diagrams for each system showing all equipment, interconnects, data flow, etc.
 4. Wiring diagrams for each subsystem defining the interconnection of all inputs and outputs for all equipment
 5. Wiring diagram for fail-safe release of electric locking mechanical
 6. Fabrication Shop Drawings for all custom equipment (if applicable)
 7. Plans and elevations of the security console(s) and equipment racks quantifying all equipment to be mounted therein
 8. Elevations of security closet layouts showing panel locations, power supply locations, conduit, wire ways, wire molds, and all other equipment
 9. Submit samples of any equipment components upon request.
 10. Samples submitted shall be the latest version of equipment.
 11. It is the responsibility of the Contractor to confirm all dimensions, quantities, and the coordination of materials and products supplied by the Contractor with other trades. Approval of Shop Drawings containing errors does not relieve the Contractor from making corrections at their expense.
 12. Submittals for individual systems and equipment assemblies that consist of more than one item or component shall be made for the system or assembly as a whole. Partial submittals will not be considered, reviewed, or stored and such submittals will not be approved.
 13. Shop Drawings shall include equipment racks, patch panels, termination blocks, connection details, rack mounting details, and any other details not included in the Construction Drawings.
- E. Any materials and equipment listed that are not in accordance with Specifications requirements may be rejected.
- F. The approval of material, equipment, systems, and Shop Drawings is a general approval subject to the Drawings, Specifications, and verification of all measurements at the job. Approval does



not relieve the responsibility of shop drawing errors. Carefully check and correct all Shop Drawings prior to submission for approval.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All materials used in this work shall be new and shall bear the inspection label of Underwriters Laboratories Inc. or certification by other recognized laboratory as required.
- B. The published standards and requirements of the Telecommunications Industries Association (TIA), National Electrical Manufacturers Association (NEMA), the American National Standard Institute (ANSI), the Institute of Electrical and Electronic Consultants (IEEE), and the American Society of Testing Materials (ASTM), are made a part of these Specifications and shall apply wherever applicable.
- C. Materials and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacture of such items, for which replacement parts are available.
- D. When more than one unit of the same class of equipment or material is required, such units shall be the products of a single manufacturer or partner manufacturers that offer a certified solution.
- E. Components of an assembled unit need not be products of the same manufacturer but must offer a certified end-to-end solution.
- F. Components shall be compatible with each other and with the total assembly for the intended service.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 LANGUAGE USAGE

- A. English language shall be used throughout the security system, signage, labels, voice messages, instructions, manuals, software, and graphic displays.

3.3 EXAMINATION OF CONDITIONS

- A. Prior to the start of work, carefully inspect the installed work of other trades and verify that such work is complete to the point where installation may properly commence. Start of work indicates acceptance of conditions.



- B. Install equipment in accordance with applicable codes and regulations, the original design intent, and the referenced standards.
- C. In the event of a discrepancy, immediately provide notification notify the Commissioner.
- D. Do not proceed with installation until unsatisfactory conditions and discrepancies have been fully resolved.

3.4 PROTECTION OF SYSTEMS AND EQUIPMENT

- A. Protect materials and equipment from damage during storage at the site and throughout the construction period. Equipment and materials shall be protected during shipment and storage against physical damage, dirt, theft, moisture, extreme temperature, and rain.
- B. Damage from rain, dirt, sun, and ground water shall be prevented by storing the equipment on elevated supports and covering the sides with securely fastened protective rigid or flexible waterproof coverings.
- C. During installation, equipment shall be protected against entry of foreign matter on the inside and be cleaned both inside and outside before testing, operating, or painting.
- D. As determined by the Commissioner, damaged equipment shall be fully repaired or shall be removed and replaced with new equipment to fully comply with requirements of the contract documents. The decision of the Commissioner shall be final.
- E. Damaged paint on equipment and materials shall be repainted with painting equipment and finished with the same quality of paint and workmanship as used by the manufacturer.

3.5 ACCESS TO EQUIPMENT

- A. Equipment shall be installed in location and manner that will allow convenient access for maintenance and inspection.
- B. Working spaces shall be not less than specified in the National Electrical Code (NEC) for voltages specified.
- C. Where the Commissioner determines that the installed equipment is not conveniently accessible for operation and maintenance, equipment shall be removed and reinstalled, one time only, as directed by the Commissioner, at no additional cost. “Conveniently accessible” is defined as being capable of being reached without the use of ladders or without climbing or crawling under or over obstacles such as motors, pumps, belt guards, transformers, piping, and duct work, except where required by the Contract Documents.

3.6 INSTALLATION

- A. The Contractor shall carefully follow the instructions in the manufacturers’ Installation Manual to ensure all steps have been taken to provide a reliable, easy to operate system.



- B. The Administrator Terminal shall be connected to the remote terminals before connecting to any card reader processors.
- C. Perform all Work as indicated in the contract documents.
- D. The Contractor shall install the appropriate cable from the CPU to readers, door contacts, request-to-exit devices, and electric locks at each door and/or gate.
- E. All communications cables shall be kept away from power circuits.
- F. The Contractor shall install the power supply(s) for electric locks in locations where they won't interfere with other operations.
- G. The Contractor shall also execute adequate testing of the system to ensure proper operation.
- H. The Contractor shall provide adequate instruction of the system users to ensure adequate understanding to prevent operating errors.

3.7 WORKMANSHIP

- A. Comply with highest industry standards, except when specified requirements indicate more rigid standards or more precise workmanship.
- B. Perform Work with persons experienced and qualified to produce workmanship specified.
- C. Maintain quality control over suppliers.
- D. Quality of workmanship is considered important. Commissioner will have the authority to reject Work which does not conform to the Contract Documents.

3.8 EQUIPMENT PRE-TEST

- A. All equipment shall be bench tested as per manufacturer's instructions prior to delivery to job site and prior to installation.

3.9 WIRE AND CABLE

- A. Design, layout, size, and plan new wire and cable runs as required.
- B. All wire and cable from the processors to all devices at each door shall be "home-run" unless otherwise specified.
- C. Wire and/or cable to be used shall be uniquely identified prior to installation of conduit, raceways, and cable trays.
- D. All wire and cable, including any wire and cable that is existing and will be reused in the Work, shall be installed in conduit or surface metal raceway, except as follows:



1. Wire or cable, in lengths of less than ten (10) feet, that is “fished” within walls, ceilings, and doorframes.
- E. All wire and cable passing thru metalwork shall be sleeved by an approved grommet or bushing.
- F. Avoid splicing conductors. All splices shall be made in junction boxes (except at equipment). Splices shall be made with an approved crimp connection. Wire nuts shall not be used on any low-voltage wiring. Where necessary, provide heat-shrink to insulate all wire splices and connections. The use of electrical tape for splices and connections shall not be acceptable.
- G. Identify all wire and cable at terminations and at every junction box. Identification shall be made with an approved permanent label.
- H. Coordinate the protection and routing of wire and cable requiring isolation from power, radio frequency (RF), electromagnetic interference (EMI), telephone, etc. with the Commissioner.
- I. Run all wire and cable continuous from device location to the final point of termination. No mid-run cable splices shall be allowed.
- J. Wire and cable within ICs, power distribution cabinets and other security enclosures shall be neatly installed, completely terminated, pulled tight with slack removed and routed in such a way as to allow direct, unimpeded access to the equipment within the enclosure. All wire and cable shall be bundled and tied.
- K. Provide heat-shrink to insulate all wire splices and connections. The use of electrical tape for splices and connections shall not be acceptable.
- L. Visually inspect all wire and cable for faulty insulation prior to installation.
- M. Provide grommets and strain relief material where necessary to avoid abrasion of wire and excess tension on Wire and Cable.
- N. Make connections with solder-less devices, mechanically and electrically secured in accordance with the manufacturers’ recommendations. Wire nuts shall not be an acceptable means of connecting wire and cable.
- O. Neatly bundle and wrap all horizontally run (above accessible ceilings and not within conduit) wire and cable at three-meter intervals. Provide supports as required. All supports shall be UL listed for the application.
- P. All System wiring within vertical riser shafts (as required) shall be bundled, wrapped and tied to the structure at three-meter intervals in order to isolate it from other wire and cable within the shaft. Additionally, all wire and cable within the shaft shall be supported at least every two floors. Provide all personnel and equipment necessary to install and support the cable. All equipment shall be UL listed for the application.

3.10 CONDUIT AND RACEWAY INSTALLATION

- A. Design, lay-out, size and plan new conduit and raceway systems as required.



- B. All security systems cabling shall be installed in conduit, raceways, or cable trays (later concealed from public view and access). The use of exposed cabling in accessible ceiling areas shall be limited to minor remodeling of existing areas but shall provide sufficient integrity so that loss of service for critical equipment or video is not compromised. Conduit below slabs on grade shall be avoided. Cable laid in tray shall be placed in locations preplanned by the Commissioner for each security sub-function and organized within trays as such with the use of dividers or other cable management devices.
- C. No exposed conduit shall be installed within public areas unless approved by Commissioner.
- D. Conduit for security systems shall be minimum 3/4" size for connections to field devices and minimum 1 1/4" size from systems equipment to functional areas (e.g. loading dock). In no case shall cabling installed as part of base building exceed 30% of cross-sectional area of conduit. Spare conduits for post construction use shall be provided from equipment spaces to pathways such as cable trays, corridors with accessible ceilings, functional areas and other common areas. A minimum of one spare 1 1/4" size empty conduit shall be provided in each run that includes a 1 1/4" conduit.
- E. Conduit shall be electric metallic tubing with compression connectors when installed in walls or above ceilings. Set screw or indenter fittings are not acceptable. Intermediate metal conduit or rigid metal conduit with threaded fittings shall be used where exposed in non-conditioned environments and similar spaces subject to moisture or fluids. All conduits shall include a fully functional and tested pull wire for installation of future additional wire/cable. All conduits shall be cleared and cleaned and a swab shall be pulled through conduit to clear all debris prior to installation of wire/cable.
- F. All device rough-in boxes shall be recess mounted in walls, ceilings, and door frames. Height and location of wall mounted boxes shall meet ADA requirements and be coordinated with device plates of other trades. Location of exit devices such as pushbuttons and motion detectors shall be coordinated with Security and carefully positioned to accommodate anticipated traffic patterns, staff limitations, and equipment movement. Specify specific distance limitations for the final construction (e.g. no further or closer than a certain distance from opening door face).
- G. Indoor Requirements:
 - 1. Route exposed conduit and raceway parallel and perpendicular to walls and adjacent piping.
 - 2. Group conduit in parallel runs where practical and use conduit rack constructed of steel channel with conduit straps or clamps.
 - 3. Use conduit bodies to make sharp changes in direction, as around beams. Fasten conduits and raceways to structural steel using approved spring clips or clamps.
 - 4. Where conduit penetrates fire-rated walls and floors, seal opening with UL listed fire rated sealer or other methods as approved by codes.
 - 5. No exposed conduit, raceway, or junction box shall be installed within any office area.
 - 6. Install all boxes straight and plumb.
 - 7. Do not support conduit from mechanical, plumbing, or fire sprinkler systems.
 - 8. Drill or core drill all holes in walls, ceilings, or floors where required for new conduits. Do not cause damage to any structural steel or other structural support member by drilling or cutting.
 - 9. Do not use flexible conduit in lengths longer than six (6) feet.



H. Outdoor Requirements:

1. In locations where conduit penetrates exterior walls, seal opening around conduit in an approved manner to make watertight.
2. Use galvanized straps and fasteners on all exterior conduit.
3. All exterior boxes will only be used to aid in pulling the cable between points.

3.11 PENETRATIONS

- A. Do not penetrate any roof, flashing, exterior wall, or parapet without prior approval from the Commissioner.
- B. When penetrating a fire wall for passage of cables and/or conduit, always provide a fire-stop system that complies with NFPA.

3.12 FIRE RATED DOORS AND FRAMES

- A. Do nothing to modify a UL-rated door or frame that would void the UL-label or fire rating.

3.13 GROUNDING

- A. Provide earth-grounding of equipment as required by equipment manufacturer. Earth ground shall be connected to ground rod or approved cold water pipe. Electrical or telephone ground connections shall not be used as earth grounds. Connections to mounting posts or building structural steel shall not be used as earth grounds.

3.14 POWER TO SECURITY EQUIPMENT

- A. Power all equipment from circuits dedicated for security use, except as noted. Mark all panel circuit breakers with labels worded "Security Equipment - Do Not Operate", or equivalent.
- B. All plug-in transformers shall be located at the security control panels. Secure all low-voltage plug-in transformers to outlet with screw or strap. Clearly label all transformers to identify purpose and use.
- C. AC power dedicated to security and on generator backup shall be provided for the Security System as indicated on the Documents. Coordinate with the Commissioner to establish locations of dedicated AC circuits.
- D. Connect to the AC power and provide UL listed power supplies and transformers to distribute low voltage power to the System components as required.
- E. Provide hinged cover terminal cabinets with tamper switches for all power supplies, transformers, and power distribution terminal strips. Provide all conduit and wiring from the AC power facilities to the terminal cabinets.
- F. Surge Protection



1. Provide protection against spikes, surges, noise, and other line problems for all System equipment and components.
2. Protect all exterior video, control, power, signal cables, and conductors against power surges. Video surge protectors shall not attenuate or reduce video and sync signals under normal conditions. Each surge protector shall be UL Listed.

3.15 CUTTING AND PATCHING

- A. The Contractor shall be responsible for all cutting, fitting, or patching that may be required to complete the Work.

3.16 PAINTING

- A. All surface raceway systems shall be painted to match the surfaces they are attached to.

3.17 PLYWOOD BACKING

- A. Install the processor(s), power supplies, and all other related equipment on a plywood backboard for testing in the shop. The mounted assembly will then be transported “as is” to the job site for mounting in the Communication Room.
- B. Fasten the plywood backing to the wall using a hanger bolt at the four corners which align with pre-drilled holes in the plywood. Secure with flat washers and a nut.

3.18 CLEANING

- A. During construction, and prior to acceptance of the building, remove from the premises and dispose of packing material and debris caused by electronic security work.
- B. Remove dust and debris from interiors and exteriors of electrical equipment. Clean accessible current carrying elements prior to being energized.

3.19 SYSTEM START-UP

- A. The Work shall be complete and ready to operate prior to final acceptance.
- B. Load the entire initial user database into all programmable systems up to the day of beneficial use of the system. The Commissioner shall assist in establishing procedural guidelines and in defining terminology and conditions unique to the City of New York’s operation.

3.20 SYSTEM ACCEPTANCE

- A. Final acceptance testing of the Work will be conducted by the Commissioner.



- B. Prior to any final acceptance testing, the Contractor shall submit two (2) sets of preliminary Record Drawings to the Commissioner. The preliminary Record Drawings are to be used by the Commissioner to conduct the system final test.
- C. The Contractor shall submit a report matrix indicating completion or delinquency for each item included in the Specification and all subsequent addenda and bulletins as part of the Work. Should work on any item be under way, but not yet fully complete, indicate the extent (or lack thereof) of completion to date, and the proposed date of completion.
- D. Conduct a complete test of the entire system and provide the Commissioner with a written report on the results of that test. During the course of this test, place the integrated system in service and calibrate and test all equipment.
- E. Fully complete a Security Systems Readiness Checklist prior to the test of the system. The checklist shall accompany the written certification to the Commissioner that the installed complete system has been calibrated, tested, and is fully functional as specified herein.
- F. Following completion of the initial testing and correction of any noted deficiencies, conduct a five (5) day burn-in test. The intent of the burn-in test shall be to prove the system by placing it in near real operating conditions. During this period the system shall be fully functional and programmed such that all points, interfaces, controls, reports, messages, prompts, etc. can be exercised and validated. Record and correct any system anomaly, deficiency, or failure noted during this period. Scheduling of the final acceptance test shall be based on a review of the results of this burn-in test.
- G. Deliver a report describing the results of functional tests, burn-in tests, diagnostics, calibrations, corrections, and repairs including written certification to the Commissioner that the installed complete system has been calibrated, tested, and are fully functional as specified herein.
- H. Prior to the final acceptance test, coordinate with the Commissioner for security related construction clean-up requirements. Security equipment closets and similar areas should be free of accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, remove all waste materials, rubbish, the Contractor's and its subcontractors' tools, construction equipment, machinery, and all surplus materials.
- I. Upon written notification from the Contractor that the system is completely installed, integrated, and operational, and the burn-in testing completed, the Commissioner will conduct a final acceptance test of the entire system.
- J. During the course of the final acceptance test by the Commissioner, the Contractor shall be responsible for demonstrating that, without exception, the completed and integrated system complies with the contract requirements. All physical and functional requirements of the project shall be demonstrated and shown. This demonstration will begin by comparing "as built" conditions of the system to requirements outlined in the Specification, item by item. Following the Specification compliance review, all system head-end equipment will be evaluated.
- K. In order to sufficiently demonstrate the system's functionality, the console operator on duty and his/her superior may be requested to perform certain daily operations inherent to the system.



1. As all of these operations depend heavily on the instruction outlined within the Specification, the Contractor shall have completed all of the required instruction prior to initiation of the final acceptance test.
- L. The functionality of all interfaces between systems will be tested.
- M. Following the system head-end equipment and console review, the installation of all field devices will be inspected. Areas examined will include general neatness and quality of installations, complete functionality of each individual device, and mounting, back box and conduit requirements compliance.
- N. All equipment shall be fully operational during testing procedures. The Contractor shall provide all personnel, equipment, and supplies necessary to perform all site testing. A minimum of two (2) employees familiar with the system for the final acceptance test shall be present during the testing. One employee shall be responsible for monitoring and verifying alarms while the other will be required to demonstrate the function of each device. Supply at least two (2) two-way radios for use during the test. A manufacturer's representative may be present on site to answer any questions that may be beyond the technical capability of the Contractor's employees, if the Contractor so elects or by specific request of the Commissioner at no charge to the City of New York.
- O. Upon successful completion of the final acceptance test (or subsequent punch list retest) the Commissioner will issue a letter of final acceptance.

3.21 INSTRUCTION

- A. Contractor shall provide complete operator instruction on the security system. Instruction shall consist of 16 hours of instruction for ten people, plus two (2) hours of individual hands-on instruction for each of ten people. Hands-on instruction shall include the opportunity for each person to operate the system, and to practice each operation that an operator would be expected to perform.
- B. Instruction shall cover all operating features of the system.
- C. Instruction sessions are to be held at the installed facility and are to be scheduled at the convenience of the City of New York. Contractor shall provide written instruction outline and agenda for each instruction session prior to scheduling.
- D. Instruction sessions shall include the opportunity for each person to operate the system, and to practice each operation that an operator would be expected to perform.
- E. Contractor shall provide written instruction materials for each of ten people.

END OF SECTION 28 00 00



SECTION 280507 - POWER SOURCES FOR 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 SUMMARY

- A. Related Documents and Sections: Examine Contract Documents for requirements that directly affect or are affected by Work of this Section. A list of those Documents and Sections include, but is not limited to the following:
 - 1. 28 00 00 Electronic Safety and Security
 - 2. 28 10 00 Access Control
 - 3. 28 14 00 Access Control Hardware Devices
 - 4. 28 16 00 Access Control Interfaces
 - 5. 28 21 00 Surveillance Cameras
 - 6. 28 23 00 Video Management System

1.3 SUBMITTAL PROCEDURES

- A. Refer to DD 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 REFERENCES

- A. All work shall be in accordance with, but not limited to, the following:
 - 1. The National Electrical Code
 - 2. American National Standards Institute (ANSI)
 - 3. National Electrical Manufacturers Association (NEMA)
 - 4. Telecommunications Industries Association (TIA)
 - 5. Electronic Industries Association (EIA)
 - 6. Institute of Electrical & Electronics Consultants (IEEE)
 - 7. Underwriters Laboratories (UL)
 - 8. American Standards Association (ASA)
 - 9. Federal Communications Commission (FCC)
 - 10. Occupational Safety and Health Administration (OSHA)
 - 11. American Society of Testing Material (ASTM)
 - 12. Americans with Disabilities Act (ADA)



- B. In the event of conflicts, the more stringent provisions shall apply.

1.6 WORK INCLUDED

- A. The scope of work for this project shall include infrastructure only for the security systems, which shall include cabling, 120VAC power, back boxes, and conduit. Refer to electrical specifications for installation of the security system infrastructure. The security drawings show security devices for reference only. The Integrated Security Management System shall consist of:
1. Access Control and Alarm Monitoring System
 2. Video Surveillance System
 3. Wire and cable to install all equipment as specified herein
 4. Miscellaneous conduit and back boxes (not shown on the Documents as provided, but required for a complete installation)

PART 2 - PRODUCTS

2.1 GENERAL

- A. All products shall be new and unused, and shall be of manufacturers' current and standard production.
- B. Where two or more equipment items of the same kind are provided, all shall be identical and provided by the same manufacturer.
- C. Drawings and Specifications indicate major system components, and may not show every component, connector, module, or accessory that may be required to support the operation specified. Contractor shall provide all components needed for complete and satisfactory and intended operation.
- D. Product Availability
1. Contractor, prior to submitting a proposal, shall determine product availability and delivery time, and shall include such considerations into his proposed Contract Time.
 2. Certain products specified may only be available through factory authorized dealers and distributors. Contractor shall verify his ability to procure the products specified prior to submitting a proposal.
- E. Wire and Cable
1. General: Provide all wire and cable required to install systems as indicated. Wire and cable shall be sized to provide minimum voltage drop and minimum resistance to the devices being supplied.
 2. All cables shall be specifically designed for their intended use (direct burial, aerial, etc.).
 3. Comply with equipment manufacturers recommendations for wire and cable size and type.



F. Conduit and Raceway Systems

1. General: The placing of surface mounted conduit on the exterior of any building shall be approved by Commissioner prior to its installation.
2. Interior Conduit:
 - a. Electrical Metallic Tubing (EMT)
 - b. Flexible Metal Conduit
 - c. Provide fittings and connectors as required for installation of EMT or flexible conduit.
3. Surface Raceways: Sheet metal channel with fitted cover, suitable for use as surface metal raceway.
 - a. Provide fittings, elbows, and connectors designed for use with raceway system.
4. Exterior Conduit: (any of the following as determined by local code requirements):
 - a. Rigid Steel Conduit
 - b. Rigid Aluminum Conduit
 - c. Rigid Nonmetallic Conduit (only if buried 18" below ground surface).
 - d. Intermediate Metal Conduit
 - e. Provide rain-tight fittings and connectors as required for installation of exterior conduit.
5. Exterior Flexible Conduit:
 - a. Liquid-tight Flexible Conduit: Flexible metal conduit with PVC jacket.
 - b. Provide rain-tight fittings and connectors as required for installation of Liquid-tight Flexible Conduit.

G. Junction and Pull Boxes

1. Interior Boxes: Sheet Metal Outlet Boxes: Sizes to be determined in accordance with code requirements for conductor fill. Provide box covers as required.
2. Exterior Boxes: All exterior boxes shall NEMA 4 or NEMA 3R, water-tight and dust-tight
3. All interior and exterior boxes shall have their covers fastened using security screws.

H. Lightning Protection

1. The Contractor shall provide suitable lightning protection for all processors/controllers.
2. All lightning protection equipment shall be UL listed.

2.2 WIRE AND CABLE

A. General Requirements:

1. Provide wire and cable as required to install the Security System as indicated on the Drawings and specified herein.
2. All wire and cable shall be Underwriter's Laboratories (UL) listed.
3. All wire and cable shall meet individual system or subsystem manufacturer Specifications.
4. All wire and cable shall be Plenum type cable and shall conform to the minimum requirements of Insulated Cable Engineers Association (ICEA) Standards.
5. Wire and cable shall comply with the applicable requirements of the National Electrical Code (NEC), latest edition, in regards to cable construction and usage.



6. The conductors of wires shall be copper and have conductivity in accordance with the standardization rules of the Institute of Electrical and Electronics Engineers, Inc. (IEEE). The conductor and each strand shall be round and free of kinks and defects.
7. All cable carrying data or voice transmissions shall be shielded. All other cable shall be shielded where necessary for interference-free signals.
8. Insulation shall be rated for a minimum of 300V.
9. Color-coding shall be accomplished by using solidly colored insulation. Grounding conductors, where insulated, shall be colored solid green or identified with green color as required by the National Electric Code (NEC).

B. Wire Types and Sizes

1. Signal Cable (Non-Power): Wire size shall be a minimum of 20 AWG, twisted, shielded, stranded, insulated, and jacketed.
2. Signal Cable (Low Voltage Power): Wire size shall be a minimum of 18 AWG, stranded, insulated, and jacketed.
 - a. Wire size shall be a minimum of 18 AWG, twisted, stranded, insulated and jacketed and shall be used for cable runs less than 500 feet.
 - b. Wire size shall be a minimum of 16 AWG, twisted, stranded, insulated and jacketed and shall be used for cable runs in excess of 500 feet, but less than 750 feet.
 - c. Wire size shall be a minimum of 14 AWG, twisted, stranded, insulated and jacketed and shall be used for cable runs in excess of 750 feet, but less than 1,250 feet.
3. Security IP Network Cabling
 - a. Shall be provided under Division 27.
 - b. Shall consist of (4) twisted pairs, 24 AWG or greater.
 - c. Shall be Category 6 Augmented cabling (CAT 6A).
 - d. Jacket color shall be Green
 - e. Refer to Div-27 Communications Specifications.
4. IP Network Patch Cables for Security Equipment
 - a. Provide patch cables for network connectivity within Security Equipment Rooms and where necessary in order to complete the Security System Work.
 - b. Shall consist of (4) twisted pairs, 24 AWG or greater.
 - c. Shall be Category 6 Augmented cabling (CAT 6A).
5. Composite Cable for Door Devices
 - a. Composite cable shall contain the following cable types: 22 AWG 6 Conductor (QTY 1), 22 AWG 2 Conductor (QTY 1), 22 AWG 4 Conductor (QTY 1), 18 AWG 2 Conductor (QTY 1)
 - b. Manufacturers: Belden 658AFS, West Penn, Windy City Wire or approved equal
6. Card Reader, Single Cable
 - a. Cable shall be an 22 AWG 6 Conductor
 - b. Manufacturers: West Penn 253270B, Belden, Windy City Wire or approved equal
7. Electric Lock Cable
 - a. Cable shall be an 18AWG 2 Conductor
 - b. Manufacturers: West Penn 25224B, Belden, Windy City Wire or approved equal
8. Door Contact Cable
 - a. Cable Shall be an 22AWG 2 Conductor
 - b. Manufacturers: West Penn 25221B, Belden, Windy City Wire or approved equal
9. Request to Exit or Accessory Cable
 - a. Cable Shall be and 18AWG 4 Conductor
 - b. Manufacturers: West Penn 25244B, Belden, Windy City Wire or approved equal



10. Panic Button Cable
 - a. Cable shall be an 18AWG 2 Conductor
 - b. Manufacturers: West Penn 25224B, Belden, Windy City Wire or approved equal

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL

- A. Provide necessary work as detailed on Section 28 00 00.

3.3 SITE INSPECTIONS

- A. Continuously verify that the site conditions are in agreement with the Contract Documents. Submit a report to the Commissioner documenting changes to the site or conditions that affect the performance of the System to be installed. For those changes or conditions, which affect System installation or performance, provide (with the report) specification sheets, or written functional requirements to support the findings, and a cost estimate to correct the deficiency.
- B. Specific mounting locations, exact wire and cable runs, and conduit routing have not been specified or delineated on the Documents. Coordinate all aspects of the Work with the Commissioner.

3.4 COORDINATION

- A. Coordinate with the Commissioner to ensure that adequate conduit is provided and that equipment back-boxes are adequate for System installation.
- B. Coordinate with the Commissioner to ensure that adequate power has been provided and properly located for the security System equipment.
- C. Coordinate with the Commissioner to ensure that doors and door frames are properly prepared for electric locking hardware and door position switches.
- D. Coordinate locations of all devices with the Commissioner prior to installation.
- E. Coordinate and verify the location of each piece of rack-mounted equipment with the City of New York.

END OF SECTION 28 05 07



THIS PAGE INTENTIONALLY LEFT BLANK



SECTION 28 10 00 - ACCESS 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. Related Documents and Sections: Examine Contract Documents for requirements that directly affect or are affected by Work of this Section. A list of those Documents and Sections include, but is not limited to the following:
 - 1. 28 00 00 Electronic Safety and Security
 - 2. 28 05 07 Power Sources for Electronic Safety and Security
 - 3. 28 14 00 Access Control Hardware Devices
 - 4. 28 16 00 Access Control Interfaces
 - 5. 28 21 00 Surveillance Cameras
 - 6. 28 23 00 Video Management System

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 REFERENCES

- A. All work shall be in accordance with, but not limited to, the following:
 - 1. The National Electrical Code
 - 2. American National Standards Institute (ANSI)
 - 3. National Electrical Manufacturers Association (NEMA)
 - 4. Telecommunications Industries Association (TIA)
 - 5. Electronic Industries Association (EIA)
 - 6. Institute of Electrical & Electronics Consultants (IEEE)
 - 7. Underwriters Laboratories (UL)
 - 8. American Standards Association (ASA)
 - 9. Federal Communications Commission (FCC)
 - 10. Occupational Safety and Health Administration (OSHA)
 - 11. American Society of Testing Material (ASTM)
 - 12. Americans with Disabilities Act (ADA)



- B. In the event of conflicts, the more stringent provisions shall apply.

1.6 WORK INCLUDED

- A. The Work shall include installation and commissioning of the following:
1. Integrated Security Management System (SMS) consisting of:
 - a. Access Control and Alarm Monitoring
 - b. Video Surveillance
 - c. Fire Alarm Interface
 2. Wire and cable to install all equipment as specified herein
 3. Miscellaneous conduit and back boxes (not shown on the Documents as provided, but required for a complete installation)

1.7 SCOPE OF WORK

- A. The scope of work to be included in this contract does not necessarily include every item of work. The Contractor shall supply and install items that meet the specified requirements of the construction documents. The SMS is designed to secure the facility with the capability of expansion to and connection to the access control VLAN or host network.
1. The SMS is the C-CURE 9000 by Software House, No Substitutions. The SMS is made up of card readers, door monitor switches, exit switches, electric locking hardware, processing equipment and various additional secured systems. The access cards use a proximity technology requiring the card be presented in proximity of a card reader. Electric locking hardware shall be installed at selected doors. All equipment installed shall be connected to the existing head-end and shall be fully compatible with that already existing.
- B. Dedicated, secure equipment space shall be provided to accommodate distributed processing equipment (access control panels) and power supplies for electric locking hardware. Equipment (including batteries and other serviceable devices) shall not be located above ceilings. SMS controllers shall be installed within the access controlled space and above ceiling in a locked and monitored enclosure with local battery backup and full functionality at controlled space if communications is lost. Any new SMS network shall be compatible for direct interconnection with current and planned networks.
- C. All doors with access control shall have a position switch to allow notification to Security of forcing door open without authorized entry, propping of the door, or opening of selected doors during times when they should not be accessed. All designated security doors, with or without card readers shall have position switch(es) to allow indication of status, with alarming software applications that provides for alarming by time of day and for door being held opened in excess of a user selectable time period or opening of selected doors during times when there should not be accessed.
- D. The work to be provided, in addition to furnishing, and installing the SMS, shall include the following:
1. Provide complete system engineering.
 2. Verification that proposed equipment and devices furnished are adequate for the intended purpose.



3. Installation, set-up, and programming of SMS server shall be done by Contractor. Coordinate with Commissioner to ensure programming is complete.
 4. Perform a layout check to ensure that adequate access is available for construction, installation, and maintenance of equipment and devices furnished; however, the Contractor is not responsible for furniture.
 5. Perform acceptance tests to show system is properly installed and that it meets the specifications.
- E. Coordinate with the Commissioner for the creation of the personnel database and assigning access levels and privileges to individual cardholders.

1.8 SYSTEM DESCRIPTION

- A. Components
1. The Contractor shall provide the SMS as specified herein including but not limited to the following:
 - a. Access control and alarm monitoring controller(s)
 - b. Access control field devices

1.9 REFERENCE CODES AND STANDARDS CITY OF NEW YORK

- A. Comply with the following:
1. National Fire Protection Association (NFPA)
 - a. 70 - National Electrical Code (NEC)
 2. Underwriters Laboratories, Inc. (UL)
 - a. Requirements, listing, and labeling

PART 2 - EXECUTION

2.1 GENERAL

- A. Approved Manufacturers and Systems
1. C-CURE 9000 reader License by Software House, No Substitutions.
- B. All products shall be new and unused, and shall be of manufacturers' current and standard production.
- C. This facility shall connect to the existing Master Application C-CURE 9000 Access control servers via the NYPL WAN. Coordinate access to the WAN with NYPL IT.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.



3.2 SITE INSPECTIONS

- A. Continuously verify that the site conditions are in agreement with the Contract Documents. Submit a report to the Commissioner documenting changes to the site or conditions that affect the performance of the System to be installed. For those changes or conditions, which affect System installation or performance, provide (with the report) specification sheets, or written functional requirements to support the findings, and a cost estimate to correct the deficiency.
- B. Specific mounting locations, exact wire and cable runs, and conduit routing have not been specified or delineated on the Documents. Coordinate all aspects of the Work with the Commissioner.

3.3 COORDINATION

- A. Coordinate with the Commissioner to ensure that adequate conduit is provided and that equipment back-boxes are adequate for System installation.
- B. Coordinate with the Commissioner to ensure that adequate power has been provided and properly located for the security System equipment.
- C. Coordinate with the Commissioner to ensure that doors and doorframes are properly prepared for electric locking hardware and door position switches.
- D. Coordinate locations of all devices with the Commissioner prior to installation.
- E. Coordinate and verify the location of each piece of rack-mounted equipment with the City of New York.
- F. Coordinate finishes and colors of all equipment with the Commissioner. Submit all finish and graphics for all equipment in public areas to the Commissioner for approval prior to installation.

END OF SECTION 28 10 00



SECTION 28 14 00 - ACCESS CONTROL HARDWARE 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. Related Documents and Sections: Examine Contract Documents for requirements that directly affect or are affected by Work of this Section. A list of those Documents and Sections include, but is not limited to the following:
 - 1. 28 00 00 Electronic Safety and Security
 - 2. 28 05 07 Power Sources for Electronic Safety and Security
 - 3. 28 10 00 Access Control
 - 4. 28 16 00 Access Control Interfaces
 - 5. 28 21 00 Surveillance Cameras
 - 6. 28 23 00 Video Management System

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 SYSTEM DESCRIPTION

- A. Components
 - 1. The Contractor shall provide the SMS as specified herein including but not limited to the following:
 - a. Access control and alarm monitoring controller(s)
 - b. Access control field devices
- B. Components
 - 1. The Contractor shall provide the SMS as specified herein including but not limited to the following:
 - a. Power supplies
 - b. Access control and alarm monitoring controller(s)



PART 2 – PRODUCTS

2.1 INTELLIGENT CONTROLLER

A. General

1. The intelligent controller shall be an Ethernet ready, fault-tolerant host communication capable for the efficient management of a large network of access panels in any system design. Once configured, the intelligent controller shall function independently of the host, and shall be capable of controlling access, managing alarms, interfacing with an array of hardware devices, all while providing the decision-making oversight that each system configuration requires.

B. Manufacturer: Software House iStar Pro 2U rack mounted controllers, No Substitutions

2.2 INPUT CONTROLLER

A. General

1. The peripheral interface device shall be used to monitor inputs or dry contact outputs to auxiliary equipment such as locks or to activate alarm.
2. Boards shall be mounted in a metal enclosure with tamper switch as needed.

B. Manufacturer: Software House I8, I8-CSI, RB, RM-4, No Substitutions.

2.3 ACCESS CONTROL CARD READER

- A. The card reader shall be proximity technology and shall read encoded data from access cards and transmit the data to the ICs. The operating frequency shall meet all local regulations
- B. A two-color LED on the face of the card reader and an audible tone shall indicate authorized and unauthorized reader uses.
- C. No system compromise shall be possible from circuitry located in the reader unit.
- D. The card reader shall have provision to operate as specified in environments of electromagnetic and radio frequency interference as well as spurious electrical line interference. When installed according to manufacturer's instructions the reader shall operate properly when mounted adjacent to or directly on any material including metal without the use of standoff or space.
- E. Provide manufacturer recommended power to each card reader directly from the IC or a secondary supply. The power supply shall be UL Class 2, power limited and shall provide necessary output voltage to allow the card reader to operate at its maximum specified read range.
- F. Manufacturer: HID SIGNO 40, No Substitutions.



2.4 ELECTRIFIED LOCKING MECHANISMS

- A. Electrified locking mechanisms shall be provided by the door hardware trade as indicated on the Documents.
- B. The security system shall interface with electrified locking mechanisms as indicated on the Documents.
- C. Provide fail-safe operation of electrified locking mechanisms as indicated under the division 08 door hardware specification.
- D. Fail-secure locks shall remain operational during a fire alarm condition or power failure.

2.5 IC POWER SUPPLY

- A. The IC Power Supply shall be dedicated to the IC and shall not provide power for locks or any other low voltage device.
- B. The Power Supply shall provide the following:
 - 1. 120 VAC 60 Hz input voltage and provide filtered and conditioned output voltage as required.
 - 2. Four (4) hours of battery backup to provide continuous operation during power failure.
 - 3. A battery charger to maintain the battery.
 - 4. Low battery and power fail contacts to monitor the status of the input power and the battery.
- C. Each Power Supply shall be housed in a locking steel enclosure designed for rack mounting. The housing shall include a tamper switch to sense the removal or opening of the enclosure cover. All power supplies, ICs, and power distribution cabinets shall be keyed alike.
- D. Manufacturer: Software House PSX-RGS Rack Mount, No Substitutions.

2.6 ELECTRIFIED LOCKING MECHANISM POWER SUPPLY

- A. Provide power supplies for all electric locking mechanisms as specified with the exception of those noted as having time-delay functions as defined by NFPA 101.
- B. Provide power supplies for all electric locking mechanisms (with the exception of fire stair doors). Fail-safe locking devices shall unlock automatically under the following conditions:
 - 1. Any building fire alarm
 - 2. Loss of building power
 - 3. Failure of the power supply
- C. Provide battery chargers and batteries sufficient for four (4) hours of backup power for the connected load for all power supplies except those for fail-safe locks.
- D. Monitor low battery and power fail alarms for each power supply.
- E. Minimum Specifications:



1. Type: UL Listed Class II power limited
2. Input Voltage: 120VAC 60 Hz
3. Output Voltage: 24 VDC
4. Output Connections: Individually fused outputs to each lock
5. Output Rating: 150% of actual connected load
6. Battery: Sealed gel type
7. Alarm Outputs: Low battery and power fail
8. Enclosure: Steel enclosure with integral lock and tamper switch

F. Manufacturer: Software Hhouse PSX-RGS Rack Mount, No Substitutions.

2.7 DOOR POSITION SWITCHES

- A. Provide magnetic door position switches to monitor the open/closed status of doors as specified herein and as indicated on the Contract Documents.
- B. All door contacts that are installed at any exterior door shall be DPDT and tied into both the access control system and intrusion system. All interior doors shall be SPST and only connected to the access control system.
- C. Concealed Door Position Switch
 1. Minimum Specifications:
 - a. Gap: 1" (25mm)
 - b. Switch Type: DPDT (Exterior)
 - c. Switch Type: SPST (Interior)
 - d. Mounting: 1" (25mm) diameter hole in door and frame
 - e. Manufacturers: Bosch, Magnasphere, Sentrol or approved equal
- D. Surface Mount Door Position Switch
 1. Minimum Specifications:
 - a. Gap: 3/4" (19mm)
 - b. Switch Type: DPDT (Exterior)
 - c. Switch Type: SPST (Interior)
 2. Contact covers shall conceal screws and terminal connections for finished look.
 3. Provide armored cable, or other protection, from the switch location to the associated junction box in order to conceal the wire.
 4. Manufacturers: Bosch, Magnasphere, Sentrol or approved equal
- E. Tamper Switch
 1. Provide normally closed tamper switches to monitor the secure status of all ICs, power supplies, and power distribution units.
 2. Minimum Specifications:
 - a. Type: Plunger with adjustable screw head
 - b. Gap: .06" to .1" (1.6mm to 2.6mm)
 - c. Switch Type: SPST
 - d. Mounting: Within cabinet with no outside access to fasteners
 3. Manufacturers: Bosch ISN-CAS, GRI, Magnasphere, or approved equal



2.8 KEYPAD – INTRUSION ZONE

- A. Provide wall mounted Software House keypad for arming / disarming the intrusion zone.
- B. Contractor shall coordinate how these devices will be scheduled for activation within the access control system with NYPL.
- C. Program intrusion zones within the access control system.
- D. Manufacturers: Software House RM2L-PH, No Substitutions.

2.9 MOTION DETECTOR – INTRUSION ZONE

- A. Provide wall mounted motion detector as indicated in the Contract documents.
- B. Contractor shall coordinate how these devices will be scheduled for activation within the access control system with NYPL.
- C. Manufacturers: DSC BV-600, DMP, Honeywell, or approved equal.

2.10 GLASS BREAK DETECTORS – INTRUSION ZONE

- A. Provide glass break sensors that shall be ceiling mounted to detector a display glass being shattered.
- B. Contractor shall coordinate how these devices will be scheduled for activation within the access control system with NYPL.
- C. Contractor shall verify all installation locations based on the glass break device chosen
 - 1. Minimum Specifications:
 - a. Detection Range 25'
- D. Manufacturers: DSC AC CC-500, DMP, Honeywell, or approved equal.

2.11 PANIC BUTTON (PB-5)

- A. Provide panic buttons as indicated in the Contract Documents.
- B. Wire panic device output to mercury input board, wire panic device input to mercury output board for LED control.
- C. Shall be desk mounted.
- D. Upon panic button activation, it shall provide an alert output to the access control system / command centers.
- E. Manufacturers: Panic Button: Sentrol – UTC 3040W, Honeywell, SDC, or approved equal.



2.12 END-OF-LINE (EOL) RESISTOR

- A. The EoL resistor (EoL resistor pack) supervises the wiring between the control panel and the field device and is required for monitoring purposes for all devices in the system.
- B. If one detection device is on a single detection circuit, the EoL should be installed at the detection device.
- C. If more than one detection device is on a single detection circuit, the EoL should be installed at the last detection device in the loop.
- D. Do not install EoL resistors at the controller or panel location(s).
- E. The input circuit shall be monitored by EoL resistors to provide detection of the following four (4) states:
 - 1. Normal
 - 2. Alarm
 - 3. Open
 - 4. Short
- F. The Contractor is to use the required EoL resistors particular for the system being furnished to provide the required four (4) state supervision.
- G. Manufacturers: GRI 6644 EoL resistor pack, Edwards, Honeywell or approved equal.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL

- A. Provide necessary work as detailed on Section 28 00 00.

3.3 SITE INSPECTIONS

- A. Continuously verify that the site conditions are in agreement with the Contract Documents. Submit a report to the Commissioner documenting changes to the site or conditions that affect the performance of the System to be installed. For those changes or conditions, which affect System installation or performance, provide (with the report) specification sheets, or written functional requirements to support the findings, and a cost estimate to correct the deficiency.
- B. Specific mounting locations, exact wire and cable runs, and conduit routing have not been specified or delineated on the Contract Documents. Coordinate all aspects of the Work with the Commissioner.



3.4 COORDINATION

- A. Coordinate with the Commissioner to ensure that adequate conduit is provided and that equipment back-boxes are adequate for System installation.
- B. Coordinate with the Commissioner to ensure that adequate power has been provided and properly located for the security System equipment.
- C. Coordinate with the Commissioner to ensure that doors and doorframes are properly prepared for electric locking hardware and door position switches.
- D. Coordinate locations of all devices with the Commissioner prior to installation.
- E. Coordinate and verify the location of each piece of rack-mounted equipment with the City of New York.
- F. Coordinate finishes and colors of all equipment with the Commissioner. Submit all finish and graphics for all equipment in public areas to the Commissioner for approval prior to installation.

3.5 EQUIPMENT

- A. Provide equipment as indicated on the Contract Documents and specified herein. Additional specific installation requirements are as follows:
 - 1. Security Equipment Room and IC Locations
 - a. Configure security equipment as indicated in the Contract Documents.
 - b. Wire all power supply power fail alarm contacts in each equipment room as a single alarm input to the SMS.
 - c. Wire each power supply low battery alarm contact as individual alarm inputs to the SMS.
 - 2. Controllers
 - a. Configure the System such that devices can be connected to spare input points, output points and card reader inputs on the controller without requiring reconfiguration of the system.
 - 3. Card Readers
 - a. Wire card reader LEDs to indicate valid and invalid card reads, and door locked and unlocked conditions. All card reader LED indicators shall operate identically.
 - 4. Electric Locking Mechanisms
 - a. Interface with electric locking mechanisms provided by the door hardware supplier.
 - b. Wire electric locking mechanisms as indicated on the Contract Documents.
 - c. Wire fail-safe electric locking mechanisms in accordance with the manufacturer's instructions.
 - d. Wire fail-secure electric locking mechanisms and power supplies such that a fire alarm condition or building power failure shall not affect operation of the lock.
 - 5. Fire Alarm Interface
 - a. Connect (hard wire) fail-safe electric and time delay locking mechanical to the building fire alarm System for fail-safe release upon any fire alarm.
 - b. Interface with a single low voltage/low current normally closed dry contact from the fire alarm System. The contact shall open on any fire alarm condition.



- c. Provide all additional UL listed fail-safe relays and power supplies necessary to interface to this contact and unlock all fail-safe doors.
- d. Connect fail-safe relays and power supplies to standard building power.
Connection of fail-safe devices to emergency or UPS power shall not be acceptable.
- e. Reference the Contract Documents for fire alarm interface requirements.

END OF SECTION 28 14 00



SECTION 28 16 00 - ACCESS CONTROL INTERFACES

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. Related Documents and Sections: Examine Contract Documents for requirements that directly affect or are affected by Work of this Section. A list of those Documents and Sections include, but is not limited to the following:
 - 1. 28 00 00 Electronic Safety and Security
 - 2. 28 05 07 Power Sources for Electronic Safety and Security
 - 3. 28 10 00 Access Control
 - 4. 28 14 00 Access Control Hardware Devices
 - 5. 28 21 00 Surveillance Cameras
 - 6. 28 23 00 Video Management System

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”.

1.4 WORK INCLUDED

- A. The Work shall include installation and commissioning of the following:
 - 1. Integrated Security Management System (SMS) consisting of:
 - a. Access Control and Alarm Monitoring
 - b. Video Surveillance
 - c. Fire Alarm Interface
 - 2. Wire and cable to install all equipment as specified herein
 - 3. Miscellaneous conduit and back boxes (not shown on the Documents as provided, but required for a complete installation)

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.



PART 2 - PRODUCTS

2.1 INTERFACE REQUIREMENTS FOR SMS/FIRE ALARM

- A. Automatic Unlock of Electric Locking Mechanisms
 - 1. Provide automatic unlocking of electric locking mechanisms controlled by the security system, upon a fire alarm condition as required.
- B. Monitoring of Fire Alarm Manual Unlock Switch
 - 1. Provide monitoring of the fire alarm system manual unlock switch for electric locking mechanisms control by the security system as required.
- C. Auxiliary Monitoring of Fire Alarm and Trouble Conditions
 - 1. Provide auxiliary monitoring of the fire alarm system general alarm and trouble conditions by the security system.
- D. System Interface
 - 1. Provide interface cabinets at each location as indicated below. Each interface cabinet shall contain all terminals required to interface each associated point to the security system as specified herein.
 - a. Security Equipment Closets – Automatic Unlock
 - b. Fire Command Center – Manual Unlock, Manual Unlock Switch Position Auxiliary Monitoring (Alarm and Trouble)
- E. Fire Alarm Interface Cabinet
 - 1. Provide lockable continuous hinge cover, U.L. listed enclosures with dual-screw barrier terminal strips for each interface point as indicated on the Security Drawings. All terminals shall be labeled to identify their function.
 - 2. The Commissioner, prior to installation, shall approve the exact style and finish of each enclosure.
 - 3. Each fire alarm interface cabinet shall provide a tamper switch to be monitored by the security system, and shall be keyed as defined by the City of New York.
- F. Automatic Unlock of Electric Locking Mechanisms
 - 1. Provide normally closed auxiliary dry output contacts such that upon a general fire alarm condition, the contacts shall open and the security system shall unlock the electric locking mechanism. The contacts shall remain open until the fire alarm system is manually reset.
- G. Monitoring of the Manual Unlock Switch
 - 1. Provide a normally closed, auxiliary dry output contact for security monitoring of the position status of the fire alarm manual unlock switch. The contact shall open when the switch is placed in the unlock position and shall remain open until the switch is returned to the locked position.
 - 2. Provide any hardware/software required to interface the fire alarm manual unlock switch to the security system.
 - 3. Provide and terminate all conduit, power and wiring required for the monitoring of the manual unlock switch.
- H. Auxiliary Monitoring of Fire Alarm and Trouble Conditions



1. Provide separate normally closed, auxiliary dry output contacts for general alarm and general trouble conditions. Upon an alarm and/or trouble condition the contact shall open and the security system shall annunciate the associated condition. The contacts shall remain open until the fire alarm system is manually reset.
- I. Fire Alarm Interface
 1. Provide any hardware/software, control logic, and/or relays required to interface the fire alarm system to the security system as specified herein.
 2. Provide and terminate all conduit, power, and wiring required for the installation of each interface cabinet.
 - a. Provide one (1) spare pair of wires, for future use, between the fire alarm system and each interface cabinet.
 3. Provide and terminate all wiring from the interface cabinet to the security system.
 4. All wiring shall be U.L. listed for fire alarm applications.

PART 3 – EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION OF CONDITIONS

- A. Prior to the start of work, carefully inspect the installed work of other trades and verify that such work is complete to the point where installation may properly commence. Start of work indicates acceptance of conditions.
- B. In the event of a discrepancy, immediately provide notification notify the Commissioner.
- C. Do not proceed with installation until unsatisfactory conditions and discrepancies have been fully resolved.

3.3 PROTECTION OF SYSTEMS AND EQUIPMENT

- A. Protect materials and equipment from damage during storage at the site and throughout the construction period. Equipment and materials shall be protected during shipment and storage against physical damage, dirt, theft, moisture, extreme temperature, and rain.
- B. Damage from rain, dirt, sun, and ground water shall be prevented by storing the equipment on elevated supports and covering the sides with securely fastened protective rigid or flexible waterproof coverings.
- C. During installation, equipment shall be protected against entry of foreign matter on the inside and be cleaned both inside and outside before testing, operating, or painting.
- D. As determined by the Commissioner, damaged equipment shall be fully repaired or shall be removed and replaced with new equipment to fully comply with requirements of the contract documents. The decision of the Commissioner shall be final.



- E. Damaged paint on equipment and materials shall be repainted with painting equipment and finished with the same quality of paint and workmanship as used by the manufacturer.

3.4 ACCESS TO EQUIPMENT

- A. Equipment shall be installed in location and manner that will allow convenient access for maintenance and inspection.
- B. Working spaces shall be not less than specified in the National Electrical Code (NEC) for voltages specified.
- C. Where the Commissioner determines that the installed equipment is not conveniently accessible for operation and maintenance, equipment shall be removed and reinstalled, one time only, as directed by the Commissioner, at no additional cost. “Conveniently accessible” is defined as being capable of being reached without the use of ladders or without climbing or crawling under or over obstacles such as motors, pumps, belt guards, transformers, piping, and duct work, except where required by design or intent.

3.5 INSTALLATION

- A. The Contractor shall carefully follow the instructions in the manufacturers’ Installation Manual to ensure all steps have been taken to provide a reliable, easy to operate system.
- B. The Administrator Terminal shall be connected to the remote terminals before connecting to any card reader processors.
- C. Perform all Work as indicated in the Drawings and Specifications.
- D. The Contractor shall install the appropriate cable from the CPU to readers, door contacts, request-to-exit devices, and electric locks at each door and/or gate.
- E. All communications cables shall be kept away from power circuits.
- F. The Contractor shall install the power supply(s) for electric locks in locations where they won’t interfere with other operations.
- G. The Contractor shall also execute adequate testing of the system to ensure proper operation.
- H. The Contractor shall provide adequate instruction of the system users to ensure adequate understanding to prevent operating errors.

3.6 WORKMANSHIP

- A. Comply with highest industry standards, except when specified requirements indicate more rigid standards or more precise workmanship.
- B. Perform Work with persons experienced and qualified to produce workmanship specified.



- C. Maintain quality control over suppliers and Subcontractors.
- D. Quality of workmanship is considered important. Commissioner will have the authority to reject Work which does not conform to the Drawings and Specifications.

3.7 EQUIPMENT PRE-TEST

- A. All equipment shall be bench tested as per manufacturer's instructions prior to delivery to job site and prior to installation.

3.8 WIRE AND CABLE

- A. Design, layout, size, and plan new wire and cable runs as required.
- B. All wire and cable from the processors to all devices at each door shall be "home-run" unless otherwise specified.
- C. All wire and cable, including any wire and cable that is existing and will be reused in the Work, shall be installed in conduit or surface metal raceway, except as follows:
 - 1. Wire or cable, in lengths of less than ten (10) feet, that is "fished" within walls, ceilings, and doorframes.
- D. All wire and cable passing thru metalwork shall be sleeved by an approved grommet or bushing.
- E. Avoid splicing conductors. All splices shall be made in junction boxes (except at equipment). Splices shall be made with an approved crimp connection. Wire nuts shall not be used on any low-voltage wiring. Where necessary, provide heat-shrink to insulate all wire splices and connections. The use of electrical tape for splices and connections shall not be acceptable.
- F. Identify all wire and cable at terminations and at every junction box. Identification shall be made with an approved permanent label, or equal.
- G. Furnish and install all SMS wire and cable with the exception of traveling cable for elevator control and monitoring.
- H. Coordinate the protection and routing of wire and cable requiring isolation from power, radio frequency (RF), electromagnetic interference (EMI), telephone, etc. with the Commissioner.
- I. Run all wire and cable continuous from device location to the final point of termination. No mid-run cable splices shall be allowed.
- J. Wire and cable within ICs, power distribution cabinets and other security enclosures shall be neatly installed, completely terminated, pulled tight with slack removed and routed in such a way as to allow direct, unimpeded access to the equipment within the enclosure. All wire and cable shall be bundled and tied.
- K. Provide heat-shrink to insulate all wire splices and connections. The use of electrical tape for splices and connections shall not be acceptable.



- L. Visually inspect all wire and cable for faulty insulation prior to installation.
- M. Provide grommets and strain relief material where necessary to avoid abrasion of wire and excess tension on Wire and Cable.
- N. Make connections with solder-less devices, mechanically and electrically secured in accordance with the manufacturers' recommendations. Wire nuts shall not be an acceptable means of connecting wire and cable.
- O. Neatly bundle and wrap all horizontally run (above accessible ceilings and not within conduit) wire and cable at three-meter intervals. Provide supports as required. All supports shall be UL listed for the application.
- P. All System wiring within vertical riser shafts (as required) shall be bundled, wrapped and tied to the structure at three-meter intervals in order to isolate it from other wire and cable within the shaft. Additionally, all wire and cable within the shaft shall be supported at least every two floors. Provide all personnel and equipment necessary to install and support the cable. All equipment shall be UL listed for the application.

3.9 CONDUIT AND RACEWAY INSTALLATION

- A. Design, lay-out, size and plan new conduit and raceway systems as required.
- B. Conduit shall be required in all exposed and/or inaccessible areas including, but not limited to finished areas concealed in chases, furring's, concrete slabs, and above finished ceilings. Provide pull boxes as necessary.
- C. No exposed conduit shall be installed within public areas.
- D. Indoor Requirements:
 - 1. Route exposed conduit and raceway parallel and perpendicular to walls and adjacent piping.
 - 2. Group conduit in parallel runs where practical and use conduit rack constructed of steel channel with conduit straps or clamps.
 - 3. Use conduit bodies to make sharp changes in direction, as around beams. Fasten conduits and raceways to structural steel using approved spring clips or clamps.
 - 4. Where conduit penetrates fire-rated walls and floors, seal opening with UL listed fire rated sealer or other methods as approved by codes.
 - 5. No exposed conduit, raceway, or junction box shall be installed within any office area.
 - 6. Install all boxes straight and plumb.
 - 7. Do not support conduit from mechanical, plumbing, or fire sprinkler systems.
 - 8. Drill or core drill all holes in walls, ceilings, or floors where required for new conduits. Do not cause damage to any structural steel or other structural support member by drilling or cutting.
 - 9. Do not use flexible conduit in lengths longer than six (6) feet.
- E. Outdoor Requirements:
 - 1. In locations where conduit penetrates exterior walls, seal opening around conduit in an approved manner to make watertight.



2. Use galvanized straps and fasteners on all exterior conduit.
3. All exterior boxes will only be used to aid in pulling the cable between points.

3.10 PENETRATIONS

- A. Do not penetrate any roof, flashing, exterior wall, or parapet without prior approval from the Commissioner.
- B. When penetrating a fire wall for passage of cables and/or conduit, always provide a fire-stop system.

3.11 FIRE RATED DOORS AND FRAMES

- A. Do nothing to modify a UL-rated door or frame that would void the UL-label or fire rating.

3.12 GROUNDING

- A. Provide earth-grounding of equipment as required by equipment manufacturer. Earth ground shall be connected to ground rod or approved cold water pipe. Electrical or telephone ground connections shall not be used as earth grounds. Connections to mounting posts or building structural steel shall not be used as earth grounds.

3.13 POWER TO SECURITY EQUIPMENT

- A. Power all equipment from circuits dedicated for security use, except as noted. Mark all panel circuit breakers with labels worded “Security Equipment - Do Not Operate”.
- B. All plug-in transformers shall be located at the security control panels. Secure all low-voltage plug-in transformers to outlet with screw or strap. Clearly label all transformers to identify purpose and use.
- C. AC power dedicated to security and on generator backup shall be provided for the Security System as indicated on the Documents. Coordinate with the Commissioner to establish locations of dedicated AC circuits.
- D. Connect to the AC power and provide UL listed power supplies and transformers to distribute low voltage power to the System components as required.
- E. Provide hinged cover terminal cabinets with tamper switches for all power supplies, transformers, and power distribution terminal strips. Provide all conduit and wiring from the AC power facilities to the terminal cabinets.
- F. Surge Protection
 1. Provide protection against spikes, surges, noise, and other line problems for all System equipment and components.



2. Protect all exterior video, control, power, signal cables, and conductors against power surges. Video surge protectors shall not attenuate or reduce video and sync signals under normal conditions. Each surge protector shall be UL Listed.

3.14 CUTTING AND PATCHING

- A. The Contractor shall be responsible for all cutting, fitting, or patching that may be required to complete the Work.

3.15 PAINTING

- A. All surface raceway systems shall be painted to match the surfaces they are attached to.

3.16 PLYWOOD BACKING

- A. Install the processor(s), power supplies, and all other related equipment on a plywood backboard for testing in the shop. The mounted assembly will then be transported “as is” to the job site for mounting in the Communication Room.
- B. Fasten the plywood backing to the wall using a hanger bolt at the four corners which align with pre-drilled holes in the plywood. Secure with flat washers and a nut.

3.17 CLEANING

- A. During construction, and prior to acceptance of the building, remove from the premises and dispose of packing material and debris caused by electronic security work.
- B. Remove dust and debris from interiors and exteriors of electrical equipment. Clean accessible current carrying elements prior to being energized.

3.18 GENERAL

- A. Provide necessary work as detailed on Section 28 00 00.

3.19 SITE INSPECTIONS

- A. Continuously verify that the site conditions are in agreement with the Contract Documents. Submit a report to the Commissioner documenting changes to the site or conditions that affect the performance of the System to be installed. For those changes or conditions, which affect System installation or performance, provide (with the report) specification sheets, or written functional requirements to support the findings, and a cost estimate to correct the deficiency.
- B. Specific mounting locations, exact wire and cable runs, and conduit routing have not been specified or delineated on the Documents. Coordinate all aspects of the Work with the Commissioner.



3.20 COORDINATION

- A. Coordinate with the Commissioner to ensure that adequate conduit is provided and that equipment back-boxes are adequate for System installation.
- B. Coordinate with the Commissioner to ensure that adequate power has been provided and properly located for the security System equipment.
- C. Coordinate with the Commissioner to ensure that doors and doorframes are properly prepared for electric locking hardware and door position switches.
- D. Coordinate locations of all devices with the Commissioner prior to installation.
- E. Coordinate and verify the location of each piece of rack-mounted equipment with the Commissioner.
- F. Coordinate finishes and colors of all equipment with the Commissioner. Submit all finish and graphics for all equipment in public areas to the Commissioner for approval prior to installation.

END OF SECTION 28 16 00



THIS PAGE INTENTIONALLY LEFT BLANK



SECTION 28 21 00 - SURVEILLANCE CAMERAS

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. Related Documents and Sections: Examine Contract Documents for requirements that directly affect or are affected by Work of this Section. A list of those Documents and Sections include, but is not limited to the following:
 - 1. 280000 Electronic Safety and Security
 - 1. 28 05 07 Power Sources for Electronic Safety and Security
 - 2. 28 10 00 Access Control
 - 3. 28 14 00 Access Control Hardware Devices
 - 4. 28 16 00 Access Control Interfaces
 - 5. 28 23 00 Video Management System

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 WORK INCLUDED

- A. The scope of work to be included in this contract does not necessarily include every item of work. The Contractor shall supply and install items that meet the specified requirements of the construction documents. The Digital Video Surveillance System (DVSS) shall be furnished complete, installed, tested, and operational.
- B. The work to be provided, in addition to furnishing and installing the DVSS, shall include the following:
 - 1. Provide complete system design and engineering.
 - 2. Provide camera equipment selections to meet the requirements/finishes of the area and lighting levels in which they will be located.
 - 3. Provide software that meets specified contract requirements.



- C. Installation, set-up, and programming of VSS server, storage.
- D. Verification that proposed equipment and devices furnished are adequate and well suited for the intended purpose.
- E. Perform a layout check to ensure that adequate access is available for construction, installation, and maintenance of equipment and devices furnished; however, the Contractor is not responsible for furniture.
- F. Perform acceptance tests to show system is properly installed and that it meets the specifications.
- G. The VSS shall consist of cameras which can be viewed within the facility and at authorized remote PCs located on the VSS network.

1.6 SYSTEM DESCRIPTION

- A. The VSS system shall be a fully electronic, state of the art, fully IP-based, color closed-circuit TV system including, but not limited to the following:
 - 1. Full integration with existing CCure 9000 Access Control System
 - 2. Video management software
 - 3. Indoor fixed and wall or ceiling mounted dome cameras
 - 4. Power over Ethernet (PoE) midspans and splitters as necessary.
 - 5. Network storage unit(s)
 - 6. Camera housings
 - 7. Equipment racks, power supplies, interfaces, camera brackets and mounts as necessary for a complete system.

PART 2 - PRODUCTS

2.1 VIDEO SURVEILLIANCE DEVICES

- A. The VSS shall be a highly scalable software and hardware solution that shall be used to:
 - 1. To influence the behavior of individuals
 - 2. To protect personnel and property,
 - 3. To provide clear evidence of an incident to assist subsequent investigations and successful prosecution
- B. Dependent upon placement of cameras or as specified herein, the VSS shall provide capabilities for the user to:
 - 1. Monitor: an observer should be able to determine the number, direction, and speed of movement of people whose presence is known
 - 2. Detect: following an alert an observer can, after a search, ascertain with a high degree of certainty whether or not a person is visible in the images displayed
 - 3. Recognize: an observer can say with a high degree of certainty whether or not the individual shown is the same as someone they have seen before



4. Identify: picture quality and detail is sufficient to enable the identity of a subject to be established

2.2 VSS EQUIPMENT

A. IP VSS Cameras

1. All cameras, wherever possible, shall be color with megapixel resolution.
2. All cameras shall utilize Power over Ethernet (PoE) unless special requirements dictate otherwise.
3. Cameras located outdoors or in low light conditions shall have day/night functionality and/or built-in IR illuminators.
4. Outdoor camera housings shall include built-in heaters and fans. Provide auxiliary power supplies as necessary to handle the additional power requirements.

B. Network Cameras (C-1, C-4)

1. Fixed Dome (4K Resolution) – American Dynamics IFS08D2ICWTT, No Substitutions.

C. Network Cameras (C-7)

1. Fixed Dome (4K Resolution) with weather shield– Hanwha XNV-9082R, No Substitutions.
2. Camera housing shall be painted to match brick facade color, coordinate color samples with The Commissioner for approval

D. KVM Controller

1. Provide rack mount KVM as indicated on TY-201.
2. KVM shall have minimum of (4) KVM inputs.
3. Contractor shall provide all based on the number of inputs of the unit.
4. Manufacture: Belkin F1DC108V, HP, Raritan, or approved equal.

E. VSS Camera Enclosures

1. Provide VSS camera housings and mounts as indicated on the Contract Documents and as specified herein.
2. Wiring to all cameras shall pass from the back box through the mount and into the housing. Exposed wiring of any kind shall not be acceptable.
3. Provide sun shields for camera housings in outdoor locations exposed directly to sunlight.
4. Provide weather and dust proof camera housings with thermostatically controlled heaters and blowers in outdoor locations.
5. Provide lightning protection for power, control, and video cables for all exterior cameras.

F. VSS Camera Enclosure Mounts

1. The Camera Enclosure Mounts shall be provided as indicated on the Documents and as specified herein. The Camera Enclosure Mounts shall be provided for wall, pendant, corner, pole, and parapet mount applications.



2. The Camera Enclosure Mounts shall be compatible and similar in design as specified camera enclosures.
3. The wall mount length shall not extend more than ten (10) inches from the wall to the enclosure base.
4. The pendant mount length shall not extend more than eight (8) inches from the ceiling to the enclosure base.
5. Coordinate with the Commissioner to establish the finish requirements for each Camera Enclosure on an individual basis. Some or all enclosure mounts may require painting to match the associated camera enclosure and surrounding surface finishes. All Camera Enclosure Mounts shall be finished as specified by the Commissioner.
6. Each Camera Enclosure Mount shall be designed to adequately support each associated camera enclosure, which shall also include the weight of the camera, lens assembly, cable, and cable fittings.
7. The Camera Enclosure Mount shall employ an adjustable swivel/tilt head to allow for enclosure rotation as necessary to obtain the correct camera field of view. Unless otherwise noted, all cabling between the conduit junction box and camera enclosure shall feed directly through the enclosure mounts. All accessible cabling shall be armored for protection. At no time shall the cabling bypass the Camera Enclosure Mount and feed directly into the camera enclosure.
8. Provide all support structure as necessary to ensure the Camera Enclosure Mount is securely fastened to the building structure.
9. Camera mounts for each VSS camera shall be approved by the Commissioner prior to installation.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL

- A. Provide necessary work as detailed in Section 28 00 00.

3.3 SITE INSPECTIONS

- A. Continuously verify that the site conditions are in agreement with the Contract Documents. Submit a report to the Commissioner documenting changes to the site or conditions that affect the performance of the System to be installed. For those changes or conditions, which affect System installation or performance, provide (with the report) specification sheets, or written functional requirements to support the findings, and a cost estimate to correct the deficiency.
- B. Specific mounting locations, exact wire and cable runs, and conduit routing have not been specified or delineated on the Documents. Coordinate all aspects of the Work with the Commissioner.



3.4 COORDINATION

- A. Coordinate with the Commissioner to ensure that adequate conduit is provided and that equipment back-boxes are adequate for System installation.
- B. Coordinate with the Commissioner to ensure that adequate power has been provided and properly located for the security System equipment.
- C. Coordinate with the Commissioner to ensure that doors and doorframes are properly prepared for electric locking hardware and door position switches.
- D. Coordinate locations of all devices with the Commissioner prior to installation.
- E. Coordinate and verify the location of each piece of rack-mounted equipment with the Commissioner.
- F. Coordinate custom SMS report requirements with the Commissioner. Submit report formats to the Commissioner for review and acceptance.
- G. Coordinate all initial database partitioning and setup with the Commissioner prior to initial programming and cardholder data entry.
- H. Coordinate finishes and colors of all equipment with the Commissioner. Submit all finish and graphics for all equipment in public areas to the Commissioner for approval prior to installation.

END OF SECTION 28 21 00



THIS PAGE INTENTIONALLY LEFT BLANK



SECTION 28 23 00 - VIDEO MANAGEMENT SYSTEM

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. Related Documents and Sections: Examine Contract Documents for requirements that directly affect or are affected by Work of this Section. A list of those Documents and Sections include, but is not limited to the following:
 - 1. 280000 Electronic Safety and Security
 - 2. 28 05 07 Power Sources for Electronic Safety and Security
 - 3. 28 10 00 Access Control
 - 4. 28 14 00 Access Control Hardware Devices
 - 5. 28 16 00 Access Control Interfaces
 - 6. 28 21 00 Surveillance Cameras

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 WORK INCLUDED

- A. The scope of work to be included in this contract does not necessarily include every item of work. The Contractor shall supply and install items that meet the specified requirements of the construction documents. The Video Surveillance System (VSS) shall be furnished complete, installed, tested, and operational.
- B. The work to be provided, in addition to furnishing and installing the VSS, shall include the following:
 - 1. Provide complete system design and engineering.
 - 2. Provide camera equipment selections to meet the requirements/finishes of the area and lighting levels in which they will be located.
 - 3. Provide software that meets specified contract requirements.
- C. Installation, set-up, and programming of VSS server, storage, and any related ancillary equipment provided under separate trade.



- D. Verification that proposed equipment and devices furnished are adequate and well suited for the intended purpose.
- E. Perform a layout check to ensure that adequate access is available for construction, installation, and maintenance of equipment and devices furnished; however, the Contractor is not responsible for furniture.
- F. Perform acceptance tests to show system is properly installed and that it meets the specifications.
- G. The VSS shall consist of cameras which can be viewed within the facility and at authorized remote PCs located on the video surveillance network.

1.6 SYSTEM DESCRIPTION

- A. The VSS system shall be a fully electronic, state of the art, fully IP-based, color closed-circuit TV system including, but not limited to the following:
 - 1. Full integration with existing CCure Access Control System
 - 2. Video management software
 - 3. Indoor fixed and wall or ceiling mounted dome cameras
 - 4. Power over Ethernet (PoE) midspans and splitters as necessary.
 - 5. Network storage unit(s)
 - 6. Camera housings
 - 7. Equipment racks, power supplies, interfaces, camera brackets and mounts as necessary for a complete system.

PART 2 - PRODUCTS

2.1 VIDEO SURVEILLANCE SYSTEM

- A. The contractor shall provide an American dynamics NVR to support video surveillance cameras installed under this scope of work.
 - 1. The NVR shall be sized for 60 Day retention at 15FPS.
 - 2. The NVR shall be sized for future growth of %25.
 - 3. The NVR shall be located in the IDF room
 - 4. The contractor shall provide all camera licensing as required.
- B. Manufacturer: American Dynamics Video Edge (2U), No Substitutions.
- C. The VSS shall be a highly scalable software and hardware solution that shall be used to:
 - 1. To influence the behavior of individuals
 - 2. To protect personnel and property,
 - 3. To provide clear evidence of an incident to assist subsequent investigations and successful prosecution.
- D. Dependent upon placement of cameras or as specified herein, the VSS shall provide capabilities for the user to:



1. Monitor: an observer should be able to determine the number, direction, and speed of movement of people whose presence is known
 2. Detect: following an alert an observer can, after a search, ascertain with a high degree of certainty whether or not a person is visible in the images displayed
 3. Recognize: an observer can say with a high degree of certainty whether or not the individual shown is the same as someone they have seen before
 4. Identify: picture quality and detail is sufficient to enable the identity of a subject to be established
- E. The VSS will offer a complete video surveillance solution that will be scalable from one to many cameras that can be added on a unit-by-unit basis.

2.2 IP VIDEO

- A. All video streams supplied from analog cameras or Internet Protocol (IP) cameras shall be digitally encoded in MPEG-4, MPEG-2, MJPEG, H.264, Wavelet, or JPEG2000 compression formats and recorded simultaneously in real time.
- B. The VSS shall interface with analog-to-digital video encoders and IP cameras, hereafter referred to as Digital Video Servers (DVS). The VSS shall support DVS from various manufacturers.
- C. Each camera's bit rate, frame rate, and resolution will be set independently from other cameras in the system, and altering these settings will not affect the recording and display settings of other cameras.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 GENERAL

- A. Provide necessary work as detailed on Section 28 00 00.

3.3 SITE INSPECTIONS

- A. Continuously verify that the site conditions are in agreement with the Contract Documents. Submit a report to the Commissioner documenting changes to the site or conditions that affect the performance of the System to be installed. For those changes or conditions, which affect System installation or performance, provide (with the report) specification sheets, or written functional requirements to support the findings, and a cost estimate to correct the deficiency.
- B. Specific mounting locations, exact wire and cable runs, and conduit routing have not been specified or delineated on the Contract Documents. Coordinate all aspects of the Work with the Commissioner.



3.4 COORDINATION

- A. Coordinate with the Commissioner to ensure that adequate conduit is provided and that equipment back-boxes are adequate for System installation.
- B. Coordinate with the Commissioner to ensure that adequate power has been provided and properly located for the security System equipment.
- C. Coordinate with the Commissioner to ensure that doors and doorframes are properly prepared for electric locking hardware and door position switches.
- D. Coordinate locations of all devices with the Commissioner prior to installation.
- E. Coordinate and verify the location of each piece of rack-mounted equipment with the Commissioner.
- F. Coordinate custom SMS report requirements with the Commissioner. Submit report formats to the Commissioner for review and acceptance.
- G. Coordinate all initial database partitioning and setup with the Commissioner prior to initial programming and cardholder data entry.
- H. Coordinate finishes and colors of all equipment with the Commissioner. Submit all finish and graphics for all equipment in public areas to the Commissioner for approval prior to installation.

3.5 SYSTEM PROGRAMMING AND DATA ENTRY

- A. Provide all initial System programming and setup of the VSS including, but not limited to the following:
 - 1. Initial setup for the interface with the SMS. The interface shall provide for automatic camera selection upon alarms within the SMS as defined in the Specification. Coordinate automatic camera selection, real-time record initialization, and recording status alarm annunciation requirements with the Commissioner prior to programming.
 - 2. Graphical Maps and Icons: Coordinate with the Commissioner to obtain AutoCAD architectural backgrounds for implementation as graphical maps. Import all AutoCAD background information provided by the Commissioner and produce a complete set of graphical maps depicting all VSS points.
 - 3. On-screen alphanumeric identification of each camera. Coordinate descriptors with the Commissioner prior to programming.
 - 4. Automatic selection of a camera adjacent to a Card Reader upon an invalid card use. Coordinate automatic camera selection requirements with the Commissioner prior to System programming.
 - 5. Automatic switching of recording from standby or reduced frame rate mode to real increased frame rate recording when an alarm occurs as defined herein.
- B. Enter all data needed to make the Security System operational. Deliver the data to the Commissioner on data entry forms, utilizing data from the Documents, Contractor's field surveys and all other pertinent information in the Contractor's possession required for complete installation of the database. Identify and request from the Commissioner any additional data



needed to make the Security System fully operational and integrated. The completed forms shall be delivered to the Commissioner for review and approval at least 90 days prior to the Contractor's scheduled date.

END OF SECTION 28 23 00



THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 28 46 00 - FIRE DETECTION AND 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. 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, coded 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. Remove, salvage, store in protected dust free environment and utilize existing fire alarm control panel GE EST-3 and Booster Power Supply.
- C. Provide all new devices to include:
 - 1. Addressable manual fire alarm stations.
 - 2. Addressable area smoke detectors.
 - 3. Addressable heat detectors.
 - 4. 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.
 - 5. Audible notification appliances; multi-tone horn (at panel), speaker/strobe combination devices.



6. Visual notification appliances; strobes.
7. Central station alarm connection control.
8. Replace existing battery with new.
9. Relays for fans shut-down.
10. Security System Interface Module.

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 description of operation of the system, similar to that provided in Part 2 of this Section of the Specifications, to include any and all exceptions, variances or substitutions.
- C. Provide manufacturer's printed product data, catalog cuts and description of any special installation procedures.
- D. Provide samples of various items when requested.
- E. 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 APPLICABLE CODES AND STANDARDS

- A. All equipment must be UL listed for its intended use.
- B. NFPA Standards 72-2010.
- C. 2011 New York City Electrical Code.
- D. New York City Fire Department, Bureau of Electrical Control and 2014 Building Codes of City of New York.

1.7 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. Coordinate with HVAC trade as necessary duct opening to install the duct smoke detectors.
 - 2. Air handling system fan control circuits and status contacts to be furnished by the HVAC control equipment.
 - 3. Raceways and wiring.

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 necessary devices as required to allow for the FACP to communicate with the Central Monitoring Station.

1.9 WARRANTY

- A. Manufacturer must guarantee the system equipment for a period of one (1) year from date of substantial completion.
- B. The contractor must guarantee all wiring and raceways to be free from inherent mechanical or electrical defects for one (1) year from date of substantial completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Fire Alarm System must be as manufactured by Edwards Systems Technology. No substitutions.
- B. The catalog numbers used are those of Edwards Systems Technology (EST), and constitute the type and quality of equipment to be furnished.

2.2 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 B operation.
- B. Where it is necessary to interface conventional initiating devices provide intelligent input modules to supervise Class B 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:
 - 1) Each electrical room.
 - 2) Each mechanical equipment room.
 - 3) Each elevator machine 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 (15/75) 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.

2.3 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 a 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 an 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.

2.4 EQUIPMENT

A. Fire Alarm Control Panel

1. The fire alarm control panel must be existing.
2. New fire alarm devices must be connected to existing fire alarm panel.



3. The existing fire alarm panel must be properly programmed.

B. Components

1. Intelligent Devices -- General

- a. Each remote device must have a microprocessor with non-volatile memory to support its functionality and serviceability. Each device must store as required for its functionality the following data: device serial number, device address, device type, personality code, date of manufacture, hours in use, number of alarms and troubles, time and date of last alarm, amount of environmental compensation left/used, last maintenance date, job/project number, current detector sensitivity values, diagnostic information (trouble codes) and algorithms required to process sensor data and perform communications with the loop controller.
- b. Each device must be capable of electronic addressing, either automatically or application programmed assigned, to support physical/electrical mapping and supervision by location. Setting a device's address by physical means must not be necessary.

2. Intelligent Detectors -- General

- a. The System Intelligent Detectors must be capable of full digital communications using both broadcast and polling protocol. Each detector must be capable of performing independent fire detection algorithms. The fire detection algorithm must measure sensor signal dimensions, time patterns and combine different fire parameters to increase reliability and distinguish real fire conditions from unwanted deceptive nuisance alarms. Signal patterns that are not typical of fires must be eliminated by digital filters. Devices not capable of combining different fire parameters or employing digital filters must not be acceptable.
- b. Each detector must have an integral microprocessor capable of making alarm decisions based on fire parameter information stored in the detector head. Distributed intelligence must improve response time by decreasing the data flow between detector and loop controller. Detectors not capable of making independent alarm decisions must not be acceptable. Maximum total loop response time for detectors changing state must be 0.5 seconds.
- c. Each detector must have a separate means of displaying communication and alarm status. A green LED must flash to confirm communication with the loop



controller. A red LED must flash to display alarm status.

- d. The 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.
- e. Each smoke detector must be capable of transmitting pre-alarm and alarm signals in addition to the normal, trouble and need cleaning information. It must be possible to program control panel activity to each level. Each smoke detector may be individually programmed to operate at any one of five (5) sensitivity settings.
- f. Each detector microprocessor must contain an environmental compensation algorithm which identifies and sets ambient “Environmental Thresholds” approximately six times an hour. The microprocessor must continually monitor the environmental impact of temperature, humidity, other contaminants as well as detector aging. The process must employ digital compensation to adapt the detector to both 24 hour long term and 4 hour short term environmental changes. The microprocessor must monitor the environmental compensation value and alert the system operator when the detector approaches 80% and 100% of the allowable environmental compensation value. Differential sensing algorithms must maintain a constant differential between selected detector sensitivity and the “learned” base line sensitivity. The base line sensitivity information must be updated and permanently stored at the detector approximately once every hour.
- g. The intelligent detectors must be suitable for mounting on any Signature Series detector mounting base.

3. Ionization Smoke Detector, SIGA-IS

- a. Provide intelligent ionization smoke detectors SIGA-IS. The ionization detector must utilize a unipolar ionization smoke sensor to sense changes in air samples from its surroundings. The integral microprocessor must dynamically examine values from the sensor and initiate an alarm based on the analysis of data. Systems using central intelligence for alarm decisions must not be acceptable. The detector must continually monitor any changes in sensitivity due to the environmental affects of dirt, smoke, temperature, aging and humidity. The information must be stored in the integral processor and transferred to the loop controller for retrieval using a laptop PC or the SIGA-PRO Signature Program/Service Tool. The ion detector must be rated for ceiling installation at a minimum of 30 ft (9.1m) centers and be suitable for wall mount applications. The ion smoke detector must be rated



for operation in constant air velocities from 0 to 75 ft/min. (0-0.38 m/sec) and with intermittent air gusts up to 300 ft/min. (1.52m/sec) for up to 1 hour.

b.

- c. The percent smoke obscuration per foot alarm set point must be field selectable to any of five sensitivity settings ranging from 0.7% to 1.6%. The ion detector must be suitable 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
- 3) Elevation: Up to 6,000 ft. (1828 m)

4. Photoelectric Smoke Detector, SIGA-PS

- a. Provide intelligent photoelectric smoke detectors SIGA-PS. The photoelectric detector must utilize a light scattering type photoelectric smoke sensor to sense changes in air samples from its surroundings. The integral microprocessor must dynamically examine values from the sensor and initiate an alarm based on the analysis of data. Systems using central intelligence for alarm decisions must not be acceptable. The detector must continually monitor any changes in sensitivity due to the environmental affects of dirt, smoke, temperature, aging and humidity. The information must be stored in the integral processor and transferred to the loop controller for retrieval using a laptop PC or the SIGA-PRO Signature Program/Service Tool. The photo detector must be rated for ceiling installation at a minimum of 30 ft (9.1m) centers and be suitable for wall mount applications. The photoelectric smoke detector must be suitable for direct insertion into air ducts up to 3 ft (0.91m) high and 3 ft (0.91m) wide with air velocities up to 5,000 ft/min. (0-25.39 m/sec) without requiring specific duct detector housings or supply tubes.
- b. The percent smoke obscuration per foot alarm set point must be field selectable to any of five sensitivity settings ranging from 1.0% to 3.5%. The photo detector must be suitable 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
 - 3) Elevation: no limit



5. Standard Detector Mounting Bases, SIGA-SB / SIGA-SB4

- a. Provide standard detector mounting bases SIGA-SB/SIGA-SB4 suitable for mounting on 1-gang, 3½” or 4” octagon box and 4” square box. The base must, contain no electronics, support all Signature Series detector types and have the following minimum requirements:
 - 1) Removal of the respective detector must not affect communications with other detectors.
 - 2) Terminal connections must be made on the room side of the base. Bases which must be removed to gain access to the terminals must not be acceptable.
 - 3) The base must be capable of supporting one (1) Signature Series SIGA-LED Remote Alarm LED Indicator.

6. Duct Detector Housing, SIGA-DH

- a. 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.

7. Intelligent Modules -- General

- a. It must be possible to address each Intelligent Signature Series module without the use of DIP or rotary switches. Devices using DIP switches for addressing must not be acceptable. The personality of multifunction modules must be programmable at site to suit conditions and may be changed at any time using a personality code downloaded from the Loop Controller. Modules requiring EPROM, PROM, ROM changes or DIP switch and/or jumper changes must not be acceptable. The modules must have a minimum of 2 diagnostic LEDs mounted behind a finished cover plate. A green LED must flash to confirm communication with the loop controller. A red LED must flash to display alarm status. The module must be



capable of storing up to 24 diagnostic codes which can be retrieved for troubleshooting assistance. Input and output circuit wiring must be supervised for open and ground faults. The module must be suitable 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

8. Intelligent Manual Pull Stations

- a. Manual pull stations must be metal double action type with CT1 module to monitor each pull station. Devices using DIP switches for addressing must not be acceptable. It must be model #RAM-1t-LD-NY manufactured by Ames. Provide 5" X 8" code card holder.

9. Remote Relays

- a. Multi-Voltage Control Relays, MR-100 Series

- 1) Provide remote control relays connected to supervised ancillary circuits for control of fans, dampers, door releases, etc. Relay contact ratings must be SPDT and rated for 10 amperes at 115 Vac. A single relay may be energized from a voltage source of 24 Vdc, 24 Vac, 115 Vac, or 230 Vac. A red LED must indicate the relay is energized. A metal enclosure must be provided.

- b. Multi-Voltage Control Relays, MR-200 Series

- 1) Provide remote control relays connected to supervised ancillary circuits for control of fans, dampers, door releases, etc. Relay contact ratings must be DPDT and rated for 10 amperes at 115 Vac. A single relay may be energized from a voltage source of 24 Vdc, 24 Vac, 115 Vac, or 230 Vac. A red LED must indicate the relay is energized. A metal enclosure must be provided.

- c. Multi-Voltage Control Relays, MR-700 Series

- 1) Provide remote control relays connected to supervised ancillary circuits for control of fans, dampers, door releases, etc. Relay contact ratings must be SPDT and rated for 10 amperes at 115 Vac. A single relay may be energized from a voltage source of 12 Vdc, 12 Vac, 24 Vdc, or 24 Vac. A red LED must indicate the relay is energized.



d. Multi-Voltage Control Relays, MR-800 Series

- 1) Provide remote control relays connected to supervised ancillary circuits for control of fans, dampers, door releases, etc. Relay contact ratings must be SPDT and rated for 10 amperes at 115 Vac. A single relay may be energized from a voltage source of 24 Vdc, or 24 Vac, or 115 Vac. A red LED must indicate the relay is energized.

e. Manual Override Control Relays, MR-600 Series

- 1) Provide remote control relays each with manual override feature connected to supervised ancillary circuits for control of fans, dampers, door releases, etc. Relay contact ratings must be SPDT and rated for 10 amperes at 115 Vac or 24 Vdc. A single relay may be energized from a voltage source of 24 Vdc or 24 Vac. A red LED must indicate the relay is energized.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 INSTALLATION

- A. The entire system must be installed in a workmanlike manner, in accordance with approved manufacturer's wiring diagram. The contractor must furnish all conduit, wiring, outlet boxes, junction boxes, cabinets and similar devices necessary for the complete installation. All wiring must be of the type recommended by the manufacturer, approved by FDNY, and must be installed in rigid, threaded conduit throughout.
- B. All penetration of floor slabs and fire walls must be fire stopped in accordance with all 2014 NYC Fire Code.
- C. End of Line Resistors must be furnished as required for mounting as directed by the manufacturer.
- D. All wiring must be color coded throughout, to NYC Electrical Code-2011 standards.

- E. The system must be arranged to receive power from one three wire 120 Vac, 15 A supply. All low voltage operation must be provided from the fire alarm control panel.
- F. Wiring
 - 1. Rigid conduit – THHN as per NYC approved.
 - 2. EMT with Teflon – 150 C – fire alarm wiring – NYC approved
 - 3. Horn circuits 3#12
 - 4. Strobes 2 #14
 - 5. All other addressable loop wires #16 AWG.
- G. Fire Alarm Fused Disconnect Power Supply (Fuse Cut-Out)
 - 1. Must be installed within 10-foot distance from the service switch and connected on the line side.

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 INSTRUCTIONS

- 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 designated personnel on the operation and maintenance of the entire system. An EST3 instruction video for the City of New York must be included as part of the system documentation.

END OF SECTION 28 4600

SECTION 31 23 00 – EXCAVATION AND FILL**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 excavation, foundation construction, filling and grading as shown on the Drawings and specified herein including, but not limited to the following:
1. Removal of existing pavements, curbs, utilities, and former foundations designated for removal; relocation of fence and fence posts when necessary and other structures encountered or left by wreckers, old walls, rubble, etc.
 2. All earth excavation to the bottom of foundation subgrades, pile caps, foundation walls, pits and slabs as required and indicated on drawings or to a lower elevation to achieve required bearing.
 3. Excavation, filling and rough grading of site area at adjacent structures and roadways as required and within the Contract Limit Line.
 4. Excavation, filling, grading and compacting to required elevations for appurtenances and site work.
 5. Excavation, filling, grading and compacting to required elevations for all floors and slabs on grade.
 6. Excavation and trenching for mechanical trades, including but not limited to all plumbing, heating, water, gas and electric within the buildings as shown or required by the drawings; backfilling same with clean fill as described hereinafter; and thoroughly compacting to "Rough Grading" elevations. Excavation, filling and grading for mechanical trades outside the building shall be the responsibility of each trade.
 7. Providing additional approved suitable material for filling and rough grading.
 8. Legal disposing off the site of surplus excavated materials unsuitable for filling or backfilling. Refer to environmental specifications.
 9. Pumping and dewatering as required for work of this section and for foundation work.
 10. Other labor and materials as may be reasonably inferred to be required to make the work under this Section complete.

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.4 SUBMITTALS

- A. Test Reports: Submit the following information for each source of each material submitted for review and comment by the Commissioner:
1. Test reports on borrow material as follows:
 - a. Particle size analysis in accordance with ASTM D 422 (sieve only)



- b. Soil classification in accordance with ASTM D 2487
 - c. Moisture content in accordance with ASTM D 2216
 - d. Modified Compaction Curve in accordance with ASTM D 1557
 - 2. Include data for all samples indicating the exact location and methods of transportation and placement of all materials.
 - 3. Include verification that borrow material is not contaminated.
- B. Samples:
- 1. Submit a 5-lb (minimum) sample of each borrow material proposed for use as general fill, drainage fill and controlled fill.
- C. Method Statement: Submit a detailed method statement, drawings, and calculations to be reviewed by the Commissioner. The method statement, drawings and calculations shall be prepared by a Professional Engineer licensed in the State of New York. The submittals shall include the following:
- 1. Earth excavation procedures.
 - 2. Backfilling and compacting material, equipment and procedures.
- D. Catalog Cuts: Submit catalog cuts and manufacturer's literature for compaction equipment, and waterproofing.
- E. Dewatering: Submit descriptions, drawings, and equipment specifications and other information detailing the means and methods to be used for local dewatering of deep pits. Methods shall be such that the groundwater lowering at the perimeter of the site does not exceed one foot or a level required to protect any adjacent structures.
- F. Certification For Examination of Site and Records: Before proceeding with the Work, submit certification in an acceptable form, signed by the Contractor, stating that careful examination has been made of the site, existing structures, existing adjacent structures, records of utility lines, test boring records, soil samples, subsurface exploration reports by the subsoil exploration consultant, the Drawings, and all other Contract Documents.

1.5 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Qualifications of Contractor for work described in this Section shall not be less than three (3) years of field experience in earthwork operations.
- C. Field Testing of Fill Areas: Prepared fill lifts will be tested and approved by the Special Inspector before construction of any further work thereon. Inspection and test of subgrades and fill layers will be taken as follows:
 - 1. Below building slabs and pit areas: For each compacted fill layer, make 1 field density test for every overlaying 2,500 sq-ft of building slab-on-grade or paved area-on-grade, but not less than 3 tests per lift. Perform field density tests in accordance with ASTM D 2922.
 - 2. Foundation wall backfill: Take at least 3 field density tests in accordance with ASTM D 2922.

1.6 STANDARDS AND REFERENCES

- A. Latest version of American Society for Testing and Materials (ASTM) standards.

- B. ACI-318 latest edition-Building Code Requirements for Structural Concrete.
- C. All work shall comply with requirements of the Building Code of the City of New York, requirements of the New York State Department of Labor, requirements of Occupational Safety and Health Administration (OSHA), requirements of New York State Department of Health (NYSDOH), requirements of the New York State Department of Environmental Conservation (NYSDEC), requirements of the New York City Department of Environmental Protection (NYCDEP), requirements of the New York State Department of Transportation (NYSDOT), requirements of New York City Department of Transportation (NYCDOT).
- D. New York City Building Code (NYCBC).

1.7 PROJECT CONDITIONS

- A. The Contractor, by careful examination, shall stay informed as to the nature and location of the work; the conformation of the ground, the nature of the subsurface conditions; the locations of the groundwater table; the character, quality, and quantity of the materials to be encountered; the character of the equipment and facilities needed preliminary to and during the execution of the work; and all other matters which can in any way affect the work.
- B. The Contractor shall be familiar with the existing conditions of adjoining properties, utilities and buildings.
- C. The Contractor shall investigate the conditions of public thoroughfares and roads as to availability, clearances, loads, limits, restrictions, and other limitations affecting transportation to, ingress and egress of the site of the work. The Contractor shall conform to all New York City and State, and Federal regulations in regard to the transportation of materials to and from and at the job site and shall secure in advance such permits as may be required.
- D. Existing Utilities: Locate existing underground utilities in and beyond the areas of work. If utilities are indicated to remain in place, provide adequate means of support and protection during the work.
 - 1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility company immediately for directions. Cooperate with Commissioner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility company.
 - 2. Do not interrupt existing utilities during occupied hours, except when permitted in writing by the Commissioner and only after acceptable temporary utility services have been provided. Provide minimum of 48 hour notice to the Commissioner, and receive written notice to proceed before interrupting any utility.
 - 3. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shutoff of services if lines are active.
- E. Examine drawings to determine sequence of operations, and relation to work of other trades. Start of work will signify acceptance of field conditions and will acknowledge coordination with other trades.
- F. Compliance with all federal, state and local environmental and health and safety regulators, including but not limited to Occupational Safety and Health Administration (OSHA).

1.8 PROTECTION

- A. The work shall be executed so that no damage or injury will occur to the existing public and adjoining or adjacent structures, streets, paving, sewers, gas, water, electric or any other pipes. Should any damage or injury caused by the Contractor, or anyone in Contractor's employ, or by the work under this Contract occur, the Contractor shall repair such damage.
- B. The above shall also include the protection of all existing utilities (including sewers, water lines, electrical lines and telecommunication lines) to remain in use within and adjacent to the area affected by the work of this project.
- C. Monuments, bench marks and other reference features on streets bounding this project, shall be protected. Should these be disturbed in any manner, the Contractor shall have them replaced.
- D. Excavation sides of any pits within the site and adjacent structure foundations shall be protected by means of adequate bracing, shoring and anchoring at all times. No site excavation shall proceed until adequate support for excavation sides is provided. Contractor is solely responsible for the stability, safety and protection of excavation sides.
- E. The Contractor shall provide barricades, warning lights, and barriers to prevent accidents, and to prevent all hazards to protect the public and property at all times, including Saturdays, Sundays, and Holiday.

1.9 ERRORS IN DEPTH

- A. In the event that any part of the excavation is carried, through error, beyond the depth and the dimensions indicated on the drawings or called for in the specifications, then the Contractor, at his own expense, shall furnish and install gravel, stone, or structural concrete with which to fill to the required level at all locations, subject to approval of the Commissioner.

1.10 SUBSURFACE STRUCTURES AND UTILITIES

- A. The Contractor shall become acquainted with the existence and location of all surface and subsurface structures and utilities within the project area and beneath the surrounding streets. Contractor shall not damage any of those utilities that are to remain and shall leave them accessible and make the necessary provision by sheeting, hanging, supporting or other means necessary to obtain this result, subject to the approval of the New York City Building Department and Department of Transportation, and the utility companies involved.

1.11 DESIGN OF TEMPORARY WORK

- A. Temporary work shall be designed and installed so that the permanent work can be conveniently and adequately erected. Contractor shall be responsible for the adequacy of temporary work.
- B. Temporary work shall be maintained in good condition.
- C. Temporary work shall be changed, shifted, rebuilt, etc., as needed to suit the conditions of the permanent work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Structural Fill or Controlled Fill: Well-graded sand and gravel, free of deleterious materials, organic material, cinders, frozen material, trash, masonry or rubble and free of stones having a dimension greater than 4 in. Of the material passing No. 4 Sieve, the percent by dry weight passing the No. 200 sieve shall be 10% or less and the percent by dry weight passing the No. 100 sieve shall be 40% or less.
- B. Drainage Fill: Clean natural $\frac{3}{4}$ -inch crushed stone (recycled concrete shall not be used as drainage fill) having the following gradations

Sieve Size	%Passing by Weight
2 inch	100
$\frac{1}{4}$ inch	25 to 60
No. 40	5 to 40
No. 200	0 to 5

- C. General Fill: Shall have no more than 20% by weight of stones or masonry debris, containing no stones or other materials greater than 4 inches in any dimension and contain less than 50% by weight materials finer than No. 200 mesh sieve.
- D. Fill for utility trenches shall meet the criteria given for structural fill and shall not contain sharp, angular pieces and pieces larger than 2 inches in any dimension.
- E. Before bringing any fill to the site, the Contractor shall submit the source for approval by the Commissioner, in accordance with Section 1.4 of this specification.
- F. All fill materials (structural, granular, and general fill) required shall be free from wood, debris, combustible materials, vegetable matter or any material subject to decay or disintegration. Fill material shall not be contaminated.
- G. The use of recycled concrete aggregate shall not be permitted for use as fill behind vertical foundation walls.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 PREPARATION OF PROJECT SITE

- A. Install all necessary protection equipment, structures such as fences, signs, scaffolding, etc. prior to start of work.
- B. Remove all existing structures, utilities, pavement in accordance with the Contract Documents.
- C. Protect all utility lines, which are not to be abandoned. Contractor shall be responsible for any damage to utilities that may occur.

3.3 PROTECTION AND MONITORING OF ADJACENT STRUCTURES, STREETS AND UTILITIES

- A. The work shall be executed so that no damage or injury will occur to the existing public and adjoining or adjacent structures, streets, paving, sewers, or utilities. Should any damage or injury caused by the Contractor, or anyone in Contractor's employ, or by the work under this Contract occur, the Contractor shall repair such damage at no additional cost.

3.4 SITE DRAINAGE

- A. The Contractor shall assume the responsibility for site drainage and shall maintain such drainage during the life of this contract in a manner so as not to adversely affect adjacent areas and structures.

3.5 PUMPING AND DEWATERING

- A. The Contractor shall assume the responsibility for site drainage upon entering the premises and shall maintain such drainage during the life of his contract so as not to adversely affect the adjacent areas.
- B. The groundwater shall be maintained at least 2 ft below the subgrade level at the time of waterproofing installation and placement of concrete.
- C. The Contractor shall, during the progress of his work, provide and maintain all required pumps, wells, suction and discharge lines, power, etc. in sufficient number, capacity, and configurations to keep all excavation, pits, trenches, footings, foundations, and the entire property area free from accumulation of water at all times and under any and all circumstances and contingencies that may arise.
- D. The methods of dewatering shall be at the option of the Contractor, provided that dewatering be accomplished in a manner that will preserve the strength of foundation strata, will not cause instability of the excavation sides, will not result in movement of excavation faces or loss of ground from beyond the property lines, and will not cause damage to existing structures, streets, pavements, and utilities.
- E. The Contractor shall be responsible for obtaining all necessary permits to dewater the site so as not to impede this or any other work.
- F. Any dewatering method selected by the Contractor or which, after installation and while in operation, causes or threatens to cause damage to adjacent property shall be modified by the Contractor at no expense to the City of New York.
- G. The Contractor shall be responsible for all remedial action and associated costs due to problems arising from improper control of surface water and groundwater.
- H. The Contractor shall not use any portion of the building foundation units or any part thereof as a sump for drainage resulting from pumping in any other area. The Contractor shall not conduct water to privately owned properties.

3.6 GENERAL EXCAVATION

- A. The excavation shall be unclassified and shall comprise and include the satisfactory removal and legal disposal of all materials encountered regardless of the nature of the materials and shall be understood to

include, boulders, earth, hardpan, miscellaneous fill, foundations, structures, slabs, walls, utilities, pavements, curbs, piping and debris.

- B. All excavation shall extend to the depths of the form and size required for the installation of the work as indicated on the drawings.
- C. Excavation shall be to required elevations for bottom of pile caps, floors, pits, slabs, walls, etc. Excavation shall be made to a depth that will allow installation of full depth of concrete slabs, sub-base, and waterproofing as shown on drawings within a 1 inch tolerance. Excavation lines shall provide sufficient clearance for the proper execution of all concrete work including allowances for formwork, shoring and inspection.
- D. Materials that, in the opinion of the Commissioner, are not suitable for fill, any surplus earth and all rock, shall be removed from the site and legally disposed of.
- E. The bottom of excavations shall be leveled and graded to receive foundations, slabs, pits, trenches and grade beams.

3.7 EXCAVATION FOR BUILDING SLABS AND STRUCTURAL MEMBERS

- A. Subgrades of building slabs and structural members including framed slabs and grade beams shall be approved by the Commissioner before proceeding with their construction. Subgrades resulting from excavation shall be free of unsuitable material (fill, loose rock pieces, organics, debris, etc.) as judged by the Commissioner.
- B. Where required, waterproofing shall be installed in accordance with the Contract Drawings and related specification.
- C. Unauthorized Excavation: Excavations performed below the elevations shown or specified, shall be filled and compacted as hereinafter specified, at no additional cost.
- D. Authorized Additional Excavation: Where the Commissioner determines that the bearing material encountered is unsuitable, remove the unsuitable bearing material. The removed material shall be replaced with controlled fill or concrete as directed by the Commissioner.

3.8 PROOFROLLING

- A. Prior to backfilling, all excavations should be proofrolled using a minimum 3-ton roller. Any loose areas identified by proofrolling should be removed and replaced with controlled fill.

3.9 FILLING, GRADING AND COMPACTING

- A. Filling and backfilling shall not be performed until work has been inspected by the Commissioner. All wood, paper and other deleterious materials shall be cleaned out from excavations before backfilling.
- B. The filling or backfilling within the area of the building shall be done so that there will be no void spaces below floors and bottoms of pits and trenches, unless otherwise noted.
- C. General: Material for fill and backfill shall be Controlled Fill as herein specified under Part 2 of these specifications. Material may be obtained from borrow sources and shall be free of any contamination.

- D. **Placing:** Place fill in horizontal 12-inch-thick maximum loose layers to produce a uniform thickness of material. Start placement in the deepest area and progress approximately parallel to the finished grade. Do not place fill where free water is standing, on frozen subsoil or on surfaces that have not been approved.
- E. **Compacting:** Compact each layer of fill with appropriate equipment listed below in this Article to achieve as a minimum the following percentages of maximum density at optimum moisture when tested in accordance with ASTM D1557:

LOCATION	% MAX. DENSITY
Under Building Slab-on-Grade	95
Under Paved Areas	95
Under Structural Members and Structural Slabs	92
Behind Foundation Walls	95

- F. **Compaction Equipment:** Granular fills (sand, gravel, friable earth) shall be compacted with a vibratory plate compactor not less than 0.5 ton in static weight to the extent possible. A jumping jack shall be used in and around penetrations, small restrictive areas, or any other areas not accessible to the roller or heavy plate compactor.
- G. **Backfilling against Foundation Walls:** After completion of foundation walls and removal of forms, clean the excavation of all trash and debris before application of waterproofing and/or vapor barrier and placement of backfill.
- H. Do not backfill against foundation or basement walls until completion of supporting floor construction to top of backfill or to first level above top of backfill, unless adequate temporary shoring is provided.
- I. In placing backfill, take special care to prevent wedge action, eccentric loading or overloading of the structure by equipment used for compacting backfill material, and to prevent damage to waterproofing on walls. Where subsoil drainage systems are installed, place backfill to prevent any damage to the systems. Any damage to waterproofing or drainage systems caused by backfilling or excavation operations shall be corrected or replaced by the Contractor at his own expense.
- J. Additional backfilling required to bring fill to the finished subgrades shown, shall be done by the Contractor only after the concrete walls or piers, against which the backfilling is done, have attained their full design strength, have been braced and the written permission to backfill is obtained from the Commissioner. If fill is required on both sides of a wall, it shall be brought up simultaneously and evenly on both sides.
- K. The Contractor shall do all filling necessary to bring the ground surfaces to the required levels for floors, pits, and areaways as shown on the drawings.
- L. Any surplus materials shall be removed from site and legally disposed of. Should additional material be required for the placing of backfill, other than material obtained from the site, the Contractor shall obtain, deliver and place accepted backfill material as required.

3.10 FIELD QUALITY CONTROL

- A. The Contractor shall collect samples and submit the following laboratory test reports on samples to the Commissioner.
 - 1. Laboratory results conducted on each type of borrow and fill material:
 - a. Gradation Analysis – ASTM D 422
 - b. Atterberg Limits – ASTM D 4318
 - c. Modified Moisture Density Curve Determination – ASTM D 1557
 - 2. The Commissioner will determine the conformance of materials to be used for fills.
- B. Field Inspection:
 - 1. All field inspections shall comply with the requirements of the New York City Building Code.
 - 2. Building Slab Subgrades: Special Inspector shall inspect subgrades for all building slabs. No pavement or slab shall be constructed unless the subgrade is approved by the Special Inspector.
 - 3. Proofrolling: Proofrolling operations shall be inspected by the Special Inspector.
 - 4. Backfilling and Compaction: A testing agency should be hired to verify the densities of the fill placed. The testing agency shall take field density tests of the fill placed and shall report to the Commissioner. No fill shall be placed without inspection and approval of the testing agency and the Commissioner. The testing agency will take field tests (in accordance with ASTM D 2922) of the subgrade for every 2,500 sq-ft, but not less than 3 tests per lift in each area, and a minimum of three tests for every compacted soil lift behind foundation walls.

3.11 CLEAN-UP

- A. All excess material including, earth, rock, fill, shall be removed from site and legally disposed of.
- B. All lumber, forms and metal work shall be removed immediately after completion of work in local areas. The Contractor shall be responsible for removal of all debris produced by work to this section from the site.
- C. Sidewalk and streets adjoining the property shall be broom-cleaned and free of debris, rubbish, trash and obstructions of any kind caused by the work of this Section.

END OF SECTION 31 23 00



THIS PAGE INTENTIONALLY LEFT BLANK



SECTION 32 05 16 – AGGREGATES 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. Section includes aggregate materials for exterior improvements:
 - 1. Drainage
 - 2. Pavement base courses.
 - 3. Gravel Border
- B. Related Sections
 - 1. Section 32 14 13 for Precast Concrete Unit Paving
 - 2. Section 32 80 00 for Irrigation

1.3 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”

1.4 SUBMITTALS

- A. Submit gradation and material analysis for all types of aggregate materials to the Commissioner, for approval prior to ordering or delivering to site.
- B. Materials Source: Submit name of imported materials suppliers to the Commissioner.
- C. Samples: Submit sample of pea gravel or crushed bluestone showing color and size gradation.

1.5 SEQUENCING AND SCHEDULING

- A. Sequence deliveries to avoid delays, but also minimize on-site storage.
- B. Conference: Convene a pre-installation conference to establish procedures to maintain optimum working conditions and to coordinate this Work with related and adjacent Work.



PART 2 - PRODUCTS

2.1 AGGREGATE MATERIALS (for Permeable Pavement Basecourses: See Section 32 14 13)

- A. Crushed Stone for drainage: Properly graded and washed non-frost susceptible crushed ledge rock. Stone must be 1-2 inches as per, NYSDOT type 3 specifications, and conforming to the following gradation requirements:

Sieve Size	Percent Passing by Weight
2 1/2 inches	100
2 inches	90-100
1 1/2 inches	35-70
1 inch	0-15
1/2 inches	0-5

- B. Aggregate for Rigid Pavements

1. Base Aggregate must consist solely of crushed ledge rock and must be broken stone or gravel, well graded, uniformly mixed washed stone aggregate. Materials must meet the gradations shown below.
 - a. Base Coarse Aggregate—3/4 inch material.

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
1 1/2"	100
3/4"	80-90
3/8"	30-65
#4	10-40
#16	0-10
#200	0-5

2. The aggregate must contain three and one-half to four percent (3.5 – 4.0%) moisture content to ensure that fine particles don't migrate and to facilitate proper compaction. The Contractor must provide certification from the source plant that aggregate meets all requirements. If deliveries of base aggregate show segregation of sizes, material must be deposited in stockpiles and thoroughly mixed prior to installation. Bank run gravel, rounded sands and recycled concrete material will be rejected for use as base aggregate.

- C. Aggregate for Gravel Border: Pea Gravel or 1/4" Crushed Bluestone.

2.2 SOURCE QUALITY CONTROL

- A. Perform testing and analysis of aggregate material in accordance with ASTM C136.
- B. If tests indicate materials do not meet specified requirements, change material or material source and retest.
- C. Provide materials of each type from same source throughout the work.



PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 STOCKPILING

- A. Stockpile materials on site as needed at locations designated by the Commissioner.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. Separate differing materials with dividers or stockpile apart to prevent mixing.
- D. Direct surface water away from stockpile site so as to prevent erosion or deterioration of materials.

3.3 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in a clean and neat condition. Grade site surface to prevent free standing surface water

END OF SECTION 32 05 16



THIS PAGE INTENTIONALLY LEFT BLANK



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. Concrete curbs and walks.
 - 2. Reinforcement.
 - 3. Joint fillers.
- B. Related Sections
 - 1. Section 03 30 00 "Cast-in-Place Concrete"
 - 2. Section 07 92 00 "Joint Sealants"

1.3 SUBMITTALS

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".
- B. Furnish test reports and materials certification as required in Section 03 30 00 "Cast-in-Place Concrete"

1.4 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Use adequate numbers of skilled workmen who are experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

PART 2 PRODUCTS

2.1 FORMS

- A. Provide steel or wood of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.
- B. Use flexible spring steel forms or laminated boards to form radius bends.



2.2 REINFORCEMENT

- A. Provide welded wire mesh conforming to ASTM A 185, 6 x 6, ten (10) gauge.

2.3 CONCRETE

A. Concrete Materials

1. Comply with the applicable requirements of Section 03 30 00 "Cast-in-Place Concrete".
2. All concrete work of this Section shall contain five (5) percent to seven (7) percent entrained air and shall be air entrained with air entraining agent; "Air-Mix" by Euclid Chemical Company, or equal by Master Builders, GCP Applied Technologies or approved equal. Agent shall conform to ASTM C 260 and shall be mixed with concrete in accordance with manufacturer's instructions.

- B. Concrete Mix, Design and Testing: Comply with applicable requirements of Section 03 30 00 "Cast-in-Place Concrete" for concrete mix design, sampling and testing, and quality control, and as herein specified. Design the mix to produce standard-weight concrete consisting of Portland cement, aggregate, air-entraining admixture and water to produce the following properties:

1. Compressive Strength: Four-thousand five hundred (4500) psi, minimum at twenty-eight (28) days, with a water cement ratio not to exceed 0.45 by weight.
2. Slump Range: Two (2) inches to four (4) inches.
3. Air Content: Five (5) percent to seven (7) percent.

2.4 JOINT FILLER

- A. Gasket: For joint fillers in concrete work, provide closed cell extruded neoprene gasket conforming to ASTM C 509, Grade 4, black.
- B. Sealant: Two (2) part self-leveling polyurethane sealant complying with ASTM C 920, Type M, Class 25, Grade P&NS; Sikaflex-2c NS/SL by Sika Chemical Co., or equal by Tremco, Pecora or approved equal. Color of sealant as selected by the Commissioner.
- C. Joint-Sealant Backer Materials: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by joint-sealant manufacturer, based on field experience and laboratory testing.

2.5 CURING

- A. Cure concrete with curing compound conforming to ASTM C 309 and Fed. Spec. TT-C-800A, modified with thirty (30) percent solids; "Kurez W VOX" by the Euclid Chemical Company or equal by Master Builders, GCP Applied Technologies or approved equal.

2.6 WATER REDUCING MIXTURE

- A. Provide water reducing and densifying admixture; "Eucon WR-75" by the Euclid Chemical Company or equal by Master Builders, GCP Applied Technologies or approved equal.



- B. The admixture shall conform to ASTM C 494, Type A, and not contain any lignosiliconates nor more than one (1) percent chloride ions.

PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 SURFACE PREPARATION

- A. Remove loose material from the compacted sub-base surface immediately before placing concrete.
- B. Proof roll prepared sub-base surface to check for unstable areas and the need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive paving.

3.3 FORM CONSTRUCTION

- A. Set forms to the required grades and lines, rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of the work and so that forms can remain in place at least twenty-four (24) hours after concrete pavement.
- B. Check completed formwork for grade and alignment to the following tolerances:
 - 1. Tops of forms not more than 1/8" in ten (10) feet.
 - 2. Vertical face on longitudinal axis, not more than 1/4" in ten (10) feet.
- C. Clean forms after each use and coat with form release agent as often as required to ensure separation from concrete without damage.

3.4 REINFORCEMENT

- A. Locate, place, and support reinforcement as specified in Section 03 30 00 "Cast-in-Place Concrete".

3.5 CONCRETE PLACEMENT

- A. Comply with the requirements of Section 03 30 00 "Cast-in-Place Concrete" for mixing and placing concrete.
- B. Do not place concrete until sub-base and forms have been checked for line and grade. Moisten sub-base if required to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around manholes or other structures until they are at required finished elevation and alignment.
- C. Placing Concrete
 - 1. Place concrete using methods which prevent segregation of the mix. Consolidate concrete along the 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.



2. Deposit and spread concrete in a continuous operation between transverse joints, as far as possible. If interrupted for more than 1/2 hour, place a construction joint.

- D. Curbs: Automatic machine may be used for curb placement. If machine placement is to be used, submit revised mix design and laboratory test results which meet or exceed the minimums herein specified. Machine placement must produce curbs to the required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not acceptable, remove and replace with formed concrete.

3.6 JOINTS

- A. Construct expansion, weakened plane (contraction), and construction joints true to line with face perpendicular to surface of the concrete. Construct transverse joints at right angles to the centerline.
- B. Weakened Plane Joints: Provide weakened plane (contraction) joints, sectioning concrete into areas as shown on the Drawings. Construct weakened plane joints for a depth equal to at least 1/4 concrete thickness.
- C. Construction Joints: Place construction joints at the end of all pours and at locations where placement operations are stopped for a period of more than 1/2 hour, except where such pours terminate at expansion joints. Use standard metal keyway section forms.

D. Expansion Joints

1. Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks, and other fixed objects, unless otherwise indicated.
2. Locate expansion joints at thirty (30) feet o.c. for each pavement lane, unless otherwise indicated.
3. Extend joint fillers full width and depth of joint, and not less than 1/2" or more than one (1) inch below finished surface where joint sealer is required. If no joint sealer required, place top of joint filler 1/8" below finished concrete surface.
4. Furnish joint fillers in one-piece lengths for the fill width being placed wherever possible. Where more than one length is required, adhere joint filler sections together.
5. Protect the top edge of the joint filler during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of joint.
6. Fillers and Sealants: Apply sealant over expansion joint where occupied space occurs below the walk. Comply with the requirements of Section 07 92 00 "Joint Sealants" for preparation of joints and installation, including priming of joints and backer rod.

3.7 CONCRETE FINISHING

- A. After consolidating and striking off concrete, level the surface by darbying or bull floating. After the concrete has stiffened sufficiently to permit the operation and the surface sheen has disappeared, the surface shall be floated. Use hand methods only where mechanical floating is not possible. Adjust the floating to compact the surface and produce a uniform texture.
- B. After floating, test surface for trueness with a ten (10) foot straight edge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.



- C. Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool, and round to 1/2" radius, unless otherwise indicated. Eliminate any tool marks on concrete surface.
- D. After completion of floating and when excess moisture or surface sheen has disappeared, complete surface finishing by drawing a fiber bristle broom across concrete surface, perpendicular to line of traffic. Repeat operation if required to provide a fine line texture acceptable to the Commissioner.
- E. Do not remove forms for twenty-four (24) hours after concrete has been placed. After form removal, clean ends of joints and point up any minor honeycombed areas. Remove and replace areas or sections with major defects, as directed by the Commissioner.

3.8 CURING

- A. Protect and cure finished concrete paving, complying with applicable requirements of Section 03 30 00 "Cast-in-Place Concrete". Use curing compound specified herein applied in accordance with manufacturer's instructions.

3.9 PROTECTION

- A. Protect concrete from damage until Substantial Completion. Exclude traffic from pavement for at least fourteen (14) days after placement. No construction traffic is permitted.

END OF SECTION 32 13 13



THIS PAGE INTENTIONALLY LEFT BLANK



SECTION 32 14 13 – PRECAST CONCRETE UNIT 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. Permeable interlocking Precast Concrete Unit Pavers
 - 2. Bedding and jointing aggregates
 - 3. Aggregate Base
- B. Related Sections
 - 1. Section 32 05 16 for Aggregates for Exterior Improvements

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM C 33 Specification for Concrete Aggregates.
 - 2. ASTM C 136 Method for Sieve Analysis for Fine and Coarse Aggregate.
 - 3. ASTM C 140 Sampling and Testing Concrete Masonry Units.
 - 4. ASTM C 144 Standard Specifications for Aggregate for Masonry Mortar.
 - 5. ASTM C 936 Specifications for Solid Interlocking Concrete Paving Units.
 - 6. ASTM C 979 Specification for Pigments for Integrally Colored Concrete.
 - 7. ASTM D 698 Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 5.5 lb (24.4 N) Rammer and 12 in. (305 mm) drop.
 - 8. ASTM D 1557 Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 10-lb (44.5 N) Rammer and 18 in. (457 mm) drop.
 - 9. ASTM D 2940 Graded Aggregate Material for Bases or Subbases for Highways or Airports.
 - 10. ASTM C 29 Bulk Density and Voids in Aggregate Materials.
- B. Interlocking Concrete Pavement Institute (ICPI)
 - 1. ICPI Tech Spec technical bulletins.
 - 2. See ICPI Tech Spec 2, Construction of Interlocking Concrete Pavements for guidance on construction practices.

1.4 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".



1.5 SUBMITTALS

- A. Shop or product drawings and product data must be submitted.
- B. Full size samples of permeable concrete paving units must be submitted to indicate color and shape selections.
- C. Sieve analysis for grading of bedding and joint opening aggregates must be submitted.
- D. Test results must be submitted from an independent testing laboratory for compliance of paving unit requirements to ASTM C 936 or other applicable requirements.
- E. The layout, pattern, and relationship of paving joints to fixtures and project formed details must be indicated.

1.6 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".

1.7 MOCK-UPS

- A. A 6 ft. x 6 ft. paver area must be installed as described in Article 3.2.
- B. This area will be used to determine joint sizes, lines, laying pattern, color, and texture of the project.
- C. This area will be the standard from which the work will be judged.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Concrete pavers must be delivered to the site in steel banded, plastic banded, or plastic wrapped cubes capable of transfer by forklift or clamp lift. The pavers must be unloaded at the job site in such a manner that no damage occurs to the product.
- B. Delivery and paving schedules must be coordinated in order to minimize interference with normal use of buildings adjacent to paving.

1.9 ENVIRONMENTAL CONDITIONS

- A. Do not install bedding aggregates or pavers during heavy rain or snowfall.
- B. Do not install bedding aggregates and pavers over frozen base materials.
- C. Do not install frozen bedding aggregates.

PART 2 - PRODUCTS

2.1 PERMEABLE CONCRETE UNIT PAVER



- A. Basis-of-Design Product: Subject to compliance with requirements, provide SF Rima, by Tremron Pavers, or comparable product by one of the following:
 - 1. Angelus Block Co., Inc.
 - 2. Belgard
 - 3. Or approved equal
- B. Dimensions: 8-inch x 8 inch x 3 inch nominal. 6 7/8 inches x 6 7/8 inches x 3 1/8 inch thick, with 1/2" spacer lugs on all four sides, actual.
- C. Color: Granite Blend
- D. Spacing: 1/2 inch
 - 1. Permeable Concrete pavers must have spacer lugs on each unit. These spacer lugs ensure a precise joint spacing between all paving stones.
- E. Pavers must meet the minimum material and physical properties set forth in ASTM C 936, Standard Specification for Interlocking Concrete Paving Units.
 - 1. Average compressive strength 8,000 psi with no individual unit under 7,200 psi.
 - 2. Average absorption of 5% with no unit greater than 7% when tested according to ASTM C 140.
 - 3. Resistance to 50 freeze-thaw cycles, when tested according to ASTM C 67, with no breakage greater than 1.0% loss in dry weight of any individual unit. This test method must be conducted not more than 12 months prior to delivery of units.
 - 4. Maximum allows breakage of product is 5%.
- E. Pigment in concrete pavers must conform to ASTM C 979. ACI Report No. 212.3R provides guidance on the use of pigments.
- F. Maximum allows breakage of product is 5%.

2.2. GRANULAR SUBBASE

- A. The granular subbase material must consist of granular material graded in accordance with ASTM D 2940.

2.3. GRANULAR BASE

- A. The granular base material must be crushed stone conforming to ASTM C 33 No 57, and Table 1.



TABLE 1
GRANULAR BASE
GRADING REQUIREMENTS

ASTM C 33 No 57	
SIEVE SIZE	PERCENT PASSING
1 ½ in (37.5 mm)	100
1 in (25 mm)	95 to 100
½ in (12.5 mm)	25 to 60
No. 4 (4.75 mm)	0 to 10
No. 8 (2.36 mm)	0 to 5

2.4. BEDDING AND JOINTING AGGREGATES

- A. The granular bedding material must be graded in accordance with the requirements of ASTM D 33 No 8.
- B. The bedding and jointing aggregate must conform to the grading requirements of ASTM C 33 No 8, and Table 2.

TABLE 2
BEDDING AND VOID OPENING AGREGATE
GRADING REQUIREMENTS

ASTM C 33 No 8	
SIEVE SIZE	PERCENT PASSING
½ in (12.5 mm)	100
3/8 in (9.5 mm)	85 to 100
No. 4 (4.75 mm)	10 to 30
No. 8 (2.36 mm)	0 to 10
No. 16 (1.18 mm)	0 to 5

2.5 SEALANT AND JOINT STABILIZER

- A. Water based hybrid polymer blend designed to bind together ASTM #8, #9, or #89 aggregate chips used in permeable interlocking concrete pavement systems to minimize chip scattering and loss. Stabilizer must bind aggregate, resist mold, moss, and algae, protect paver and joint surfaces from staining, and be breathable upon application so as to allow moisture to evapo-transpire, avoiding efflorescence.
 - 1. Color: Natural
 - 2. Finish: Satin
- B. Products:
 - 1. B-1000 PermStik as manufactured by SureBond,
 - 2. (NSS) Natural Stabilizing Sealer as manufactured by B.P. Pro
 - 3. Techniseal Pro Series Permeable Joint Stabilizer, New England Silica, Inc.
 - 4. Or approved equal.



PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

- A. Verify that subgrade preparation, compacted density and elevations conform to the specifications.
- B. Verify that geotextiles, if applicable, have been placed according to specifications and drawings.
- C. Verify that aggregate base materials, thickness, compaction, surface tolerances and elevations conform to the specifications.
- D. Verify the proper installation of the concrete curbing, in terms of location, elevation, and adherence to the specifications.
- E. Verify that the base is dry, uniform, even and ready to support bedding coarse aggregates, pavers, and imposed loads.
- F. Upon acceptance of the base materials and edge restraints, installation of the bedding and coarse aggregates may begin.

3.3 SITE PREPARATION

- A. The site must be stripped of all topsoil and other objectionable materials to the grades specified.
- B. All subdrainage of underground services within the pavement area must be completed in conjunction with subgrade preparation and before the commencement of subbase construction.
- C. After trimming to the grades specified, the pavement is to be proof rolled to a percentage of Standard Proctor Maximum Dry Density. Soft spots or localized pockets of objectionable material must be excavated and properly replaced with approved granular material.
- D. The subgrade must be trimmed to within 0 to 3/8 in. (0 to 10 mm) of the specified grades. The surface of the prepared subgrade must not deviate by more than 3/8 in. (10 mm) from the bottom edge 39 in. (1 m) straight edge laid in any direction.
- E. The Contractor must ensure that the prepared subgrade is protected from damage from inundation by surface water. No traffic will be allowed to cross the prepared subgrade. Repair of any damage resulting will be the responsibility of the Contractor and will be repaired at their own expense.
- F. Under no circumstances will further pavement construction proceed until the subgrade has been inspected by the Commissioner.

3.4 GRANULAR SUBBASE AND BASE INSTALLATION



- A. After proper construction of the concrete curb edge restraints for the interlocking pavement as per Section 3.4, and upon approval by the Consultant, aggregate subbase (as specified in design) and base must be placed in uniform lifts not exceeding 6 in (150 mm) loose thickness and roller compacted according to the AASHTO guidelines for installing open graded aggregates. Because the subbase and base are open graded aggregated materials, a method specification is appropriate for guidance in all aggregate compactive force.
 - 1. Subbase thickness must be as shown.
 - 2. Base thickness must be as shown.
- B. The granular base must be trimmed to within to within 0 to 3/8 inch (0 to 10 millimeters (mm)) of the specified grade. The surface of the prepared base must not deviate more than: (an example: 3/8 inch (10 mm) from the bottom edge of a 10 feet (3 meters (m)) straight edge laid in any direction).
- C. Before commencing the placing of bedding aggregate course and the placement of the permeable concrete pavers, the base must be inspected by the Commissioner.

3.5 PAVER INSTALLATION

- A. Spread the bedding aggregate evenly over the base course and screed to a nominal 1 1/2 to 2 inches, (28 mm to 51 mm) thickness. The bedding aggregate should not be disturbed. Place sufficient bedding aggregate to stay ahead of the laid pavers. Do not use the bedding aggregate to fill depressions in the base surface.
- B. Paver placement may proceed only after acceptance of the pavers.
- C. Pavers must be free of foreign material before installation.
- D. Pavers will be inspected for color distribution and all chipped, damaged, or discolored pavers must be replaced. Maximum allow breakage as per 2.1, section F.
- E. The pavers must be laid in pattern(s) as shown on the drawings.
- F. Joints between the pavers must be maintained according to the spacer lugs.
- G. Gaps at the edges of the paved area must be filled with cut pavers.
- H. Pavers to be placed along the edge must be cut with a masonry saw.
- I. Upon completion of cutting, the area must be swept clean of all debris to facilitate inspection and to ensure pavers are not damaged during compaction.
- J. Low amplitude, high frequency plate compactor must be used to compact the pavers. Use Table 3 below to select size of compaction equipment:

TABLE 3
PAVER THICKNESS AND REQUIRED MINIMUM
COMPACTION FORCE

PAVER THICKNESS	COMPACTION FORCE
3 1/8 inches (80 mm)	5000 lbs [22 kN]



- K. The pavers must be compacted, and the bedding aggregates must be swept into all joints and void openings until they are full. This will require at least two or three passes with the compactor. Do not compact within 3 feet (1 m) of the unrestrained edges of the paving units.
- L. All work to within 3 feet (1 m) of the laying face must be left fully compacted at the completion of each day.
- M. Excess surface bedding and void opening aggregates must be swept off when the job is complete.
- N. The final surface elevations must not deviate, as an example, more than 1/4 inch (10 mm) under a 10 feet (3 m) long straight edge.
- O. The surface elevation of pavers must be 1/8 to 1/4 inches (3 to 6 mm) above adjacent drainage inlets, concrete collars, or channels.

3.6 JOINT STABILIZATION

- A. After compaction and final sweeping apply joint stabilizer based on manufacturer's recommendations. Apply two (2) coats.

3.7 FIELD QUALITY CONTROL

- A. Final elevations must be checked for conformance to the drawings after removal of excess jointing aggregate.

END OF SECTION 32 14 13



THIS PAGE INTENTIONALLY LEFT BLANK



SECTION 32 80 00 - IRRIGATION

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. Water supply stub to be provided for Irrigation Contractor's point of connection as indicated on the plans.
2. Furnishing and installing automatic drip irrigation system including piping, dripper line, fittings, quick coupling valves, gate valves, drain valves, backflow preventer any accessories necessary to complete the installation as outlined in the Contract Documents.
3. All material to be incorporated in the work, all labor performed, and all appliances, tools and methods will be subject to the inspection and approval or rejection of the Commissioner.
4. The Contractor will provide all sleeves necessary for irrigation piping. Sleeves will be required when piping crosses, or comes into contact with, obstacles, walls, or utilities.
5. All material must be as specified. Any alternate manufacturers must be submitted for approval before being substituted as an equal.
6. The Contractor must verify all site utility locations in the and immediately adjacent to the area of work. Any damage to utilities during construction will be repaired at the Contractor's expense.
7. The Contractor must test and make operative the irrigation system.

B. Related Sections:

1. Division 26 – Electrical
2. Division 22 – Plumbing
3. Section 32 91 00 for Planting Preparation
4. Section 32 93 00 for Plants

1.3 COORDINATION

- A. Coordinate installation of irrigation system with plumbing, electrical, pedestal underlayment system, custom fiberglass planters and planter liners, vegetated roof systems, and plantings.

1.4 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site or other location determined by the Commissioner.
1. Review layout requirements.
 2. Review coordination with other work.



1.5 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 “Submittal Procedures”

1.6 SUBMITTALS

- A. Shop Drawings: Contractor is responsible for providing shop drawings of recommended irrigation design based on the proposed planting design. The quantity, type and location of all pipes, fittings, valves, etc. must be indicated based on the specifications herein.
- B. Product Data: All materials of every description are to be furnished exactly as specified and must be new and of the best quality and grade obtainable. Contractor, before beginning work herein specified must submit to the Commissioner for approval: Manufacturer’s technical product data and installation instructions; and Three (3) sets of material submittals, bound, and indexed for all irrigation system materials and products to be furnished. If Contractor requires more than one (1) copy of submittal returned, the appropriate number must increase the initial submittal. Material submittals will include, but are not limited to, the following:
 - 1. Dripper Lines and Lateral Lines, Main Lines
 - 2. Valves (including, but not limited to, Gate/Drain, Quick Coupling, Remote Control, and Pressure Regulation Valves)
 - 3. Filters
 - 4. Pipes and Fittings
 - 5. Access Boxes
 - 6. Automatic Controller
 - 7. Backflow Preventer
 - 8. Cement
 - 9. Control Wire
 - 10. Sleeves/Foam Pipe Insulation
 - 11. Drains/Flush Valves
 - 12. Weather Sensors
- C. All materials which are to be used must be submitted for approval before work begins, whether they are as specified or a substitution for materials specified.
- D. Record Drawings: During the course of the installation, the Contractor is responsible for recording all changes made during installation. The Commissioner will supply one reproducible copy of the Irrigation Plan for this purpose. Contractor must submit reproducible copy plus six (6) sets of As-Built Drawings with details for approval. Drawings submitted must show Contractor’s title block with name, address, scale, and project name. If contractor requires more than one (1) copy of submittal returned, the initial submittal must be increased by the appropriate number. Once the As-Built Drawings have been approved, they will be used as a permanent record of the installation.
- E. Maintenance Data: Submit maintenance data and parts lists for irrigation system materials and products. Include these recommended run time (base line) data, product data, shop drawings and record drawings in a maintenance manual.



1.7 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.
- B. Manufacturer’s Qualifications: An entity meeting the minimum requirements of DDC General Conditions Section 01 40 00 Article 1.7.
- C. Codes and Standards:
 - 1. Comply with City of New York plumbing code.
 - 2. All materials and work must meet the requirements of the A.W.W.A., A.S.S.E. and the USC Foundation for Cross Connection Control.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Storage: Inspect all materials delivered to the site for damage. Unload and store with the minimum of handling. Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris. Protect pipe and fittings from exposure to direct sunlight over extended periods.
- B. Handling: Handle materials in such a manner as to ensure delivery to the trench in sound undamaged condition.

1.9 PIPING ARRANGEMENT

- A. Suggestions for changes in location of piping, etc., by the Contractor must be submitted to the Commissioner for approval before proceeding with the work, with written assurance that such changes will not cause any extra cost on their part or the part of any other Contractor and will not cause any alteration of design requirements.

1.10 GUARANTY

- A. Guaranty all work done for two (2) years from date of acceptance against all defects in material, equipment, and workmanship. Guaranty cover repair of damage to any part of the premise resulting from leaks, or other defects in material, equipment, and workmanship to the satisfaction of the Commissioner. Repairs, if required, must be done promptly, at no cost to the Commissioner.
- B. Guaranty will include spring start-up and winterizing of system within one (1) year of time and development of approved water application schedule. Winter damage due to improper winterization is the responsibility of the Contractor.
- C. All repairs and servicing required under the guaranty period must be made under the observation of the Facilities maintenance crew to help instruct them in the proper operation and repair of the system.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products as follows:



1. Hunter Industries
2. Netafim USA
3. Rain Bird Corporation
4. Or Approved Equal.

2.2 MATERIALS

A. General:

1. Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements.
2. All materials throughout the system must be new and in perfect condition.

B. Piping – Provide pipes of one of the following materials of weight/class indicated. Provide pipe fittings and accessories of same material and weight/class as pipes, with joining method as indicated:

1. Polyvinyl Chloride (PVC): Sized as shown on drawings. All PVC pipe must be continuously and permanently marked with manufacturer's name, material and schedule or type. Pipe must conform to U.S. Department of Commerce Commercial Standard CS 256-63, or latest revision. All PVC pipe must be SDR 21.
2. Polyethylene (Poly): The contractor may install polyethylene laterals, header, and footers in substitute of PVC due to the curvature of the planting beds.
Fittings: Schedule 40, polyvinyl chloride (PVC) weight as manufactured by Spears or approved equal. Solvent weld and insert fittings are acceptable. No saddle tube clamping or fittings must be used. Fittings to conform to ASTM D-2466.

C. Valves:

1. Gate/Drain Valves: Must be sized for mains. The valves must be all bronze solid wedge, screw bonnet rated at 200 WOG.
2. Quick Coupling Valves: Must be 1" brass valves with locking top and hose swivel, located on main lines. As indicated on the plans.
3. Remote Control Valves: All Drip zones must be installed with valve and filter assemblies as indicated on the Plan. All valves/assemblies must be installed in utility rooms allowing space for appropriate size and type for valves/assemblies specified with manual isolation shut-off valve to match pipe size.

D. Ne Sub-Surface Drip – Continuously Self-Flushing, Pressure-Compensating Dripper line: Dripperline tubing is a low volume dripper line with integral and evenly spaced pressure compensating drippers at specified intervals discharge rate must be (0.90) in gallons per hour (GPH).

1. Dripperline: the dripper line must consist of nominal sized one-half inch low density linear polyethylene tubing, housing internal pressure compensating, continuous self-cleaning, integral drippers at a specified spacing (12" and 18" centers). The tubing must be brown in color and conform to an outside diameter (O.D.) of 0.67 inches and an inside diameter (I.D.) of 0.57 inches. Individual pressure compensating drippers must be welded as an integral part of the tubing assembly. These drippers must be constructed of plastic with a rigid plastic diaphragm retainer and a soft rubber diaphragm extending the full length of the dripper.
2. The drippers must have the ability to independently regulate discharge rates, with an inlet pressure of (7-70 PSI) seven to seventy pounds per square inch (PSI), at a constant flow and with a



manufacturer's coefficient of variation (Cv) of 0.03. Recommended operating pressure must be between 15-45 PSI. The dripper discharge rate must be 0.92 gallons (GPH) utilizing a combination turbulent flow/reduced pressure compensation cell mechanism and a diaphragm to maintain uniform discharge rates. The drippers must continuously clean themselves while in operation. The dripper line must be available in 12", 18" & 24" spacing between drippers unless otherwise specified. Dripperline pipe depth must be 4" unless otherwise specified.

E. Dripperline Accessories

1. Fittings:
 - a. Dripperline fittings must be constructed in one of the following end configurations:
 - 1) Barbed insert fittings only,
 - 2) Male pipe threads (MPT) with barbed insert fittings, or
 - 3) Female pipe threads (FPT) with barbed insert fittings.
 - b. All fittings must be constructed of molded brown plastic having a nominal outside dimension (I.D.) of 17 mm or (0.57"). Female and male threaded ends must be capable of mating to standard PVC pipe threads with tapered threads.
 - c. Dripperline connections must be compatible with the approved dripperline. Fittings must be achieved by pushing the tubing and fitting together and twisting side to side until the tubing abuts to either adjoining tubing or a fitting stop.
2. Line Flushing Valve - Line Flushing Valves are used to reduce sediment build-up within the Dripperline tubing and to pass sediment or debris, which may not have been captured by the disc filter.
 - a. The line-flushing valve must be constructed of brown molded plastic with one of the following end configurations:
 - 1) 1/2" MPT
 - 2) Insert barbed fitting
 - b. The line-flushing valve must operate at the beginning of the irrigation cycle as the system begins to pressurize, but before drip operation begins, and must be capable of flushing approximately one gallon of water at 50 psi maximum, or 1.5 psi minimum. Note: Permanent damage could be sustained to the line-flushing valve where incoming pressure exceeds 50 psi. Pressure regulators are required even with pressure regulating remote control valves which tend to pause for a brief period of time before pressure regulation occurs.
 - c. Line Flushing Valves are to be installed below grade, as detailed, in a valve box to allow for periodic inspection and are to be installed in one of two ways:
 - i. Vertically: with the dome portion facing upward, installed on a 90 degree elbow.
 - ii. Horizontally: with the dome portion facing sideways.
3. Air/Vacuum Relief Valve – the air vacuum relief valve serves two purposes; 1) to evacuate air from the Dripperline laterals during system start-up and, 2) to prevent a vacuum from occurring after the remote-control valve has closed thus avoiding debris intrusion into the drippers at the higher locations in the zone.
 - a. The air/vacuum relief valve must be constructed of black and/or grey plastic with a 1/2" male pipe thread capable of mating with a threaded PVC reduction bushing or 1/2" FIPT fitting.
 - b. Design and installation techniques require that these valves be installed at the highest elevation in each zone (some zones may require more than one) in order to expel air and relieve vacuum. In a zone where the highest elevation occurs between the intake and exhaust headers (such as a mound or berm), an air relief lateral must interconnect the Dripperlines to avoid the necessity



- of installing one air relief valve on each Dripperline lateral. Valves can be installed below grade in valve boxes to allow for periodic inspection.
4. Pressure Regulation Valve - The purpose of the pressure regulator is to control downstream pressure at or below the specified system operating pressure. Unregulated pressures in excess of the recommended operating ranges can diminish and disable line-flushing valves or cause the integrity of the Dripperline fitting connection to diminish and/or fail.
 - a. The pressure regulator must be a spring-operated piston-type unit with an externally accessible regulation unit that can be serviced without removing the valve from the system. The body must be molded of black plastic with a combination of male/female pipe threaded inlet and outlet. Removable and interchangeable springs must be color-coded to denote varying pressure ranges.
 - b. The regulator must have a built-in indicator that shows when it is operating. It must be able to respond immediately to any inlet pressure variation. The regulator must be capable of regulating from 15 PSI to 50 PSI.
 5. Disc Filter - The purpose of the disc filter is to capture and retain water-transported debris or sediments that could reduce the efficiency of the Drippers.
 - a. The filter must be a multiple disc filter with color-coded filter elements indicating the size of the element being used. The discs must be constructed of chemical-resistant thermoplastic for corrosion resistance.
 - b. The disc filter body must be molded of black plastic with male pipe threads for both inlet and outlet. A portion of the disc filter must be capable of periodic servicing by unscrewing a threaded cap or unlatching the band. The 3/4" model must have an integral manual shut-off valve option.
 - c. Typical installation of the disc filter must be per the enclosed details or based on regional practices. Disc filters can be installed downstream of the remote-control valve to allow for periodic servicing when the remote-control valve is not operating or upstream of the remote-control valve if the disc filter is specified with manual shut-off valve or when a line size ball valve is also specified to allow for periodic servicing with a pressurized mainline. Disc filters must be installed below grade and positioned in a valve box large enough to remove the cap and internal disc element. A gravel sump, 6 inches deep, must be placed at the bottom of the valve box to drain off water during periodic maintenance procedures. The filters can be installed above ground when security enclosures are provided.
 6. Stainless Steel Clamps (for operating pressures in excess of 45 psi) - Stainless steel clamps are made to secure Dripperline tubing to insert barbed fittings. Clamps must be one "ear" type clamps. Nominal size recommended for use with Dripperline is 13/16", Part No. 210.
 - a. Clamps must be constructed of 304 AISI stainless steel. Clamps must be one "ear" type and formed with a "dimple," allowing for thermal expansion and contraction properties without loosening the clamp.
 - b. Interior clamp wall must be smooth to prevent crimping or pinching of tubing. Wall thickness of clamps must be .0236" (0.6 mm) with an overall band width of 1/4" (7 mm).
 - c. Stainless steel clamps are used to secure Dripperline tubing over barbed fittings when design-operating pressures exceed 45 psi. Clamps are to be slipped over the tubing before being fitted to barbed insert fittings. Place the clamp between the first and second ridge of the barbed fittings. Crimp the "ear" of the clamp tightly with a pincer tool. Crimp twice to ensure proper seating.
 7. Dripper Plug Ring - The dripper plug ring is a plastic pre-formed ring with an inside rounded plug that can be used to plug Dripperline outlets.



- a. The filter must be a multiple disc filter with color-coded filter elements indicating the mesh size of the element being used. The discs must be constructed of chemical resistant thermoplastic for corrosion resistance.
 - b. The dripper plug ring is constructed of black molded plastic of a diameter slightly larger than the outside diameter of the Dripperline tubing. The circular design is open on one end to enable it to be slipped over the tubing. Within the interior of this ring (opposite the open end) is a rounded plug made to press-fit into the water outlet of the dripper to prevent water emission.
 - c. Slip the dripper plug ring over the Dripperline tubing and push the plug into the water outlet until it seats into the inlet hole securely.
- 8. Tie Down Stakes: sturdy, 9 gauge galvanized steel 'U' shaped stakes for securing distribution tubing to the soil surface.
- F. Reduced Pressure Backflow Prevention Units – reduce pressure backflow prevention units must be provided by others as indicated on drawings and must be in compliance with City of New York Plumbing Code.
- G. Solvent Cement: Compatible with PVC pipe and or proper consistence ADTM D-2564.
- H. Control Wires - 24volt solid wire, UL approved for direct burial ground. Minimum wire size 14 gauge. Common must be 12 gauges.
- I. Expansion Curls – Expansion curls must be provided within three (3) feet of each wire connection to solenoid. (Expansion curls are formed by wrapping at least 5 turns of wire around a rod or pipe 1" or more in diameter, then withdrawing the rod).
- J. Sleeves/Conduit for Control Wires – PVC 1220-160 psi pipe or galvanized heavy wall steel conduit. Minimum size 1 1/4" I.D.
- K. Sleeves for Irrigation Pipe – Through walls/Planters, Schedule 40 PVC pipe or as otherwise approved by the Commissioner. Not all sleeved pipes may be shown on plan. The size of the pipe sleeves are to be (1 1/2) times the O.D. of sleeved pipe.
- L. Valve Boxes –Irrigation valve boxes shown in planting areas must be of appropriate size and type for valves specified. All valve boxes to be wrapped in landscape filter fabric and have 4" of pea gravel to allow for drainage.
- M. Drains – Air hose connection shown of approved design must be provided for winterizing at the location shown so that the entire system may be drained by blowing air through the pipe with compressed air.
- N. Rubber Hose – One (1) heavy duty rubber hose, 50 feet long, for use with hose swivel quick coupling valve must be furnished by the Contractor.
- O. Automatic Controllers – The contractor must install a modular irrigation controller of proper station count with a remote Wireless Solar Sync /Rain switch device. See plan for locations. This accessory must be installed as per manufacturer's instructions.



- P. Weather Sensor – The contractor must install a smart irrigation control device that calculates evapotranspiration rates based on historical data as well as solar, humidity and rainfall factors and adjusts the irrigation application on a daily basis. The sensor must include rain and temperature sensors and must be compatible with the Automatic Controller. The Weather Sensor must be hard wired to the Automatic Controller.

PART 3 - EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

- A. General: Examine areas and conditions under which irrigation system's materials and products are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.
- B. Mark out the entire system, including pipes and valves. Final mark-out must be reviewed by the Commissioner prior to installing to ensure that no conflicts with related site improvements occur.

3.3 INSTALLATION

A. Planted Areas – Excavation and Backfill

1. The Contractor must furnish all labor, materials, and equipment for the excavation and backfilling of pipe trenches, and other structures as shown on the Drawings. This item of work includes protection of existing structures, pipe embedment, trench backfill, and the maintenance of the construction area during progress of the work. The described includes delivery and storing of material and all vehicular traffic related thereto.
2. Contractor must confirm location and mark out all utilities within the area of work and take necessary precautions to prevent damage.
3. The width of trenches for installation of irrigation lines must be in accordance with pipe manufacturer's requirements. Trench widths must not be less than is necessary for proper construction.
4. The depth of the irrigation line trenches must be determined by the site conditions, but must be located within the areas of planting soil as follows:
 - a. 8" minimum cover over water lines; planting areas.
 - b. 4" minimum soil cover over lateral line drip tubing.
5. Planted areas must be backfilled with care, replacing each layer of soil in the order in which it was removed.

B. Pipe and Assembly

1. Carefully inspect all pipe, fittings, and accessories before installation. Reject any defective material.
2. Remove all fins and burrs and thoroughly clean all pipe fittings and accessories before jointing and placement.



3. Cut pipe accurately to measurements established at the site and work into place without springing or forcing.
4. Plastic pipe and fittings must be solvent welded using solvents and methods as recommended by the manufacturer of the pipe, except where screwed connections are required. Pipe and fittings must be thoroughly cleaned of dirt, dust, and moisture before applying solvent with a non-synthetic bristle brush.
5. No pipe must be laid when, in the opinion of the Commissioner, opening or weather conditions are unsuitable. When pipe laying is not in progress, the open ends of the installed pipe must be closed by approved means to prevent entrance of dirty water and other foreign material into the line.
6. All sleeving must extend 18" beyond the edge of pavement, curb or building face. If site conditions allow. Assembly of piping must meet all manufacturers' requirements.
7. Pipe must be protected during storage and handling against impact shocks, or free fall. Pipe must be kept clean at all times and no pipe must be used that does not conform fully with standards or specifications herein described. All pipe and appurtenances must be installed in strict accordance with these specifications. Any section of pipe found to be defective either before or after laying must be replaced with new sections without additional expense to the Commissioner.
8. Pipe may be assembled and welded on the surface. Cutouts in joists must provide room side to side to allow for expansion and contraction. For ease of drip area pipe assembly "push in" fittings with "O" ring seals, for 1 1/2" PVC must be used for dripperline connections to header / footer pipes.
9. Before placing into the designated area, each section of pipe must be inspected for defects. Defective pipe will be rejected. Deflections from a straight line or grade, as required by vertical curves, horizontal curves, or offsets, must not exceed piping manufacturer's requirements for snaking. If alignment required deflections in excess of limitations or undue stress upon the pipe, the Contractor must provide joints or a sufficient number of shorter lengths of pipe to provide angular deflections within the limit set forth.
10. During construction operations, the pipe interior must be kept clean by means of plugs or other approved methods. Pipe must not be laid in water, or when trench or weather conditions are unsuitable for work proposed, except by permission of the Commissioner. When work is not in progress, open ends of pipe and fittings must be securely closed so that no dirty water, debris, or other materials will enter the pipe or fittings. Prior to completing the joint, the Contractor must ensure that each section of pipe must rest solidly upon the rooftop bed. Pipe must be laid at locations shown on the drawings.
11. All pipe and appurtenances must be installed so as to prevent contact with rock, mulch, or other excessively acid, alkaline, or unstable soils, destructive to physical properties of the pipe. Make all connections between plastic pipe and metal valves or steel pipe with threaded fittings using plastic male adapters.

C. Valves:

1. All valves must be installed in accordance with details and this specification.
2. Install remote valves where shown and group together where practical; place no valve closer than six (6) inches to walk edges, buildings and walls.
3. All valves in planting areas must be installed in valve boxes of appropriate size mounted on smooth brick supports, wrapped in landscape filter fabric and include 4 "of clean washed pea gravel for drainage.

D. Drip Lines - All drip lines or drippers must be installed with the intent and in accordance with the details on the drawings.



1. Dripperline is designed for use in surface and sub-surface applications utilizing a grid design, the result being a complete wetted area within the grid. The most uniform way to install Dripperline is in the sub-surface and a grid, at a uniform depth as specified.
2. Dripperline is available in dripper flow rates of 0.61 gallons per hour (gph) and 0.92 gallons per hour (gph) with drippers spaced at 12 inch, 18 inch or 24 inch intervals.
3. The drippers are designed to regulate flow at the specified output from 7 psi to 70 psi with maximum recommended pressure of 45 psi when using unclamped Dripperline insert fittings.
4. The choice of dripper spacing, Dripperline lateral spacing and depth is dependent on the soil type and plants being used. The following chart gives spacing as designed for landscape applications herein.
5. General Spacing Guidelines as designed for Dripperline for landscape applications:

Trees, Shrub Beds, and Ground Cover Applications

Dripper Flow	0.92 GPH
Dripper Interval	12"
Dripperline Lateral Spacing	18"
Burial Depth	4"
Application Rate	.96 in/hr
Time to Apply 1/4" of water	16 min.

6. It is necessary to use Dripperline insert fittings for all Dripperline connections to ensure the integrity of the connection. Dripperline has an ID of 0.57," or 17 mm, which differs from most other polyethylene tubing dimensions and improperly sized fittings will cause leaks.
7. Dripperline can be installed by trenching, laying it out on a sub-grade lower than finished grade and backfilling to the specified grade depth. Sub-surface installation must use plastic rebar supports to hold it in place along with tie down stakes and shredded bark mulch cover.
8. Install all drip tubing as detailed on drawings or specifications. Use only Teflon tape on all threaded connections.

E. Closing of Pipe and Flushing Lines

1. Cap or plug all openings as soon as lines have been installed to prevent the entrance of materials that would obstruct the pipe. Leave in place until removal is necessary for completion of installation.
2. Thoroughly flush out all water lines before installing valves and other hydrants.
3. Test in accordance with Section 3.4, Paragraph A, Hydrostatic Test.

F. Backfilling, Replacing Pavers and Compacting:

1. After system is operating, and required tests and inspections have been made, backfill excavations and trenches with clean soil, free of rubbish.
2. Backfill all trenches, replace any items which may have been removed for installation.
3. Compact trenches in areas to be planted by thoroughly flooding the backfill.
4. Dress off all areas to finish grades.

G. Valve Boxes

1. All valve boxes must be installed with the intent and in accordance with details and this specification.



2. Valve boxes in planting areas must be set on firm brick or paver base, installed with landscape fabric wrap and pea gravel to allow for drainage.

H. Controller

1. Controller must be installed in/on the proposed building as indicated on the drawings. The Commissioner will determine the remote Rain Switch transmitter location.
2. Connect remote control valves to controller in a logical sequence to correspond with specifications. See plan for numbering.

I. Control Cable

1. Install control wires in PVC conduit and lay to the side of the main line. All control cable must be of size for voltage drops no less than 14 gauge and must be installed in PVC conduit. Wire must be "snaked" into the conduit as loose as possible and with as much "slack" as possible to allow for expansion and contraction of the wire.
2. Control wire Connections of all underground wires must be by the use of wire nuts, covered with 3m DBR waterproof splice for each wire per installation instructions provided by the manufacturer, or as otherwise required by local ordinance.
3. Install control wires, mains, and laterals in the same area whenever possible.
4. All wires passing under existing or future paving, construction, etc., must be encased in PVC plastic or galvanized steel conduit extending at least twelve (18) inches beyond edges of paving or constructions. Depending on site conditions.
5. All wire connections at remote control valves must be left with sufficient slack so that in case of repair the valve bonnet of splice may be brought to the surface without disconnecting the wires.
6. Each individual controller must have a separate common ground wire system entirely independent of the common ground wire system of all other controllers. Only those remote-control valves which are being controlled by one controller, must be connected to that controller's common ground wire system.

3.4 INSTALLATION

- A. Finished work must be of uniform profile, accurately fitted, rigid and strong, square, and true, neat in appearance, smooth, flush and free from dents, waves, warps, buckles, open joints, tool marks and other defects.
- B. Reveals and joints must be of uniform width and in alignment. Exposed joints must be hairline which must not exceed 1/64th of an inch in width. Finished surfaces of panels must all be in the same plane, with no exposed lips between adjacent panels.
- C. Locate and place items level and plumb and in alignment with adjacent construction. Perform cutting, drilling, and fitting required to install components.
 1. Do not cut or abrade finishes that cannot be completely restored in the field. Return items with such finishes to the shop for required alterations, followed by complete refinishing, or provide new units as required.
- D. Use concealed anchorages where possible. Locations of exposed fasteners are subject to the approval of the Commissioner.



- E. Install concealed gaskets, joint fillers, sealants, and insulation, as the Work progresses, to make items lightproof as applicable to type of fabrication indicated.

3.5 FLUSHING AND TESTING

- A. Hydrostatic Test:
 - 1. Request the presence of the Commissioner at least 48 hours in advance of testing
 - 2. Testing to be accomplished at the expense of the Contractor, and in the presence of the Commissioner.
 - 3. Center load piping with small amount of backfill to prevent arching or slipping under pressure.
 - 4. Apply a continuous and static water pressure of no more than 60 psi when welded plastic joints have cured at least 24 hours and with the risers capped as follows:
 - a. Main Lines and sub mains to be tested for one (1) hour.
 - b. Lateral lines to be tested for one (1) hour.
 - 5. Repair leaks resulting from tests.
 - 6. The lines must then be retested until deemed satisfactory by the Commissioner.

3.6 OPERATING INSTRUCTIONS

- A. After completion and testing of the system, the Contractor will instruct the City of New York's personnel in the proper operation and maintenance of the system.

3.7 PROTECTION

- A. Contractor is responsible for work until finally inspected, tested and accepted. After delivery, and before and after installation, protect work against theft, injury, or damage. Protect open ends of work with temporary covers or plugs during construction, to prevent entry of obstruction material.

3.8 WINTERIZATION AND START-UP

- A. The Contractor must winterize the system prior to first freeze, using compressed air at no more than 30 psi.
- B. The Contractor will be responsible for the first start-up the following season.
- C. Provide flush valves at the ends of the drip line for flushing the system.
 - 1. Review the system's features, operations, and procedures with City of New York's staff to instruct them on all annual winterizing and start-up maintenance functions.
 - 2. The contractor will provide the Commissioner with a binder which will include all cut sheets, operating manuals, guaranty information, and parts lists or the irrigation system.

END OF SECTION 32 80 00



SECTION 32 91 00 - PLANTING PREPARATION

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:
1. Preparation and placement of Planting Soil.
 2. Preparation and placement of Horticultural Subsoil.
- B. Related Sections:
1. Section 05 50 00 for Metal Fabrications
 2. Section 32 05 16 for Aggregates for Exterior Improvements
 3. Section 32 80 00 for Irrigation
 4. Section 32 93 00 for Plants

1.3 REFERENCES:

- A. American Society for Testing and Materials (ASTM) Standards, Methods:
1. C 136-01: "Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates" (Dry Sieving).
 2. D 422-63 (2002): "Standard Test Method for Particle-Size Analysis of Soils" (Hydrometer).
 3. D 698: "Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort" (Standard Proctor).
 4. ASTM D3385 - 09 Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer.
 5. D 1556-00: Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
 6. D 2167-94: Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
 7. D 2922-01: Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
 8. D 4972-01: "Standard Test Method For pH of Soils" using distilled water.
 9. F 1647-02a: "Standard Test Method for Organic Matter Content of Putting Green and Sports Turf Zone Mixes.
- B. Solvita Manual, Version 4.0, Standard Lab Protocol for determining the maturity and stability of composted organic matter.
- C. Recommended Soil Testing Procedures for the Northeastern United States, 2nd Edition, Northeastern Regional Publication No. 493, Agricultural Experiment Stations of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont



and West Virginia, Revised, December 15, 1995: Referenced Document may be obtained on the web at <http://ag.udel.edu/EXTENSION/agnr/soiltesting.htm>. Tests include the following:

1. Test for soil Organic Matter by loss of weight on ignition, as described in Northeastern Regional Publication No. 493, p. 59.
 2. Test for soil CEC by exchangeable acidity method as described in Northeastern Regional Publication No. 493, p. 64.
 3. Test for soil Soluble Salts must be by the 1:2 (v:v) Soil:Water Extract Method as described in Northeastern Regional Publication No. 493, p. 74.
 4. Test for Buffer pH by the SMP method as described in Northeastern Regional Publication No. 493, p. 20.
- D. New York State Department of Environmental Conservation, Division of Solid and Hazardous Materials:
1. Recycling of Organic Waste Through Composting, Land Application, and Other Means, 6 NYCRR Subparts 360-1 through 360-5.
- E. Code of Federal Regulations Title 40, Chapter I-Environmental Protection Agency:
1. 40 CFR Part 503 rule, Table 3, page 9392, Vol. 58 No. 32.
- F. American Society of Agronomy
- G. State of New York, Department of Transportation, latest edition.
- H. American Association of Nurserymen, American Standards for Nursery Stock, (ANSI Z60.1), latest edition, published by the American Association of Nurserymen, 1250 I Street, N.W., Suite 500 Washington, D.C. 20005.
- I. ANSI: American National Standards Institute.

1.4 DEFINITIONS:

- A. Subgrade: Soil material and levels resulting from the approved rough grading work. Subgrade soil must be existing soil or other materials which are either undisturbed or have been placed resulting from the approved rough grading work. Loosening of all subgrade areas prior to placement of Planting Soils is included in this Section.
- B. Planting Soils: Planting Soils are composed of a blend of three base components: base loam, organic material, and sand. The quality of the blend depends on the quality of the original components. Contractor is responsible for locating and obtaining approval of sources for base loam, organic material and sand that meet the Specification requirements. Contractor is then responsible for mixing the components. Approximate mixing ratios are provided, but may require adjustment, depending on the final materials and with the approval of the Commissioner, in order to meet Specification requirements for each blend.

1.5 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.6 SUBMITTALS:



- A. At least 30 days prior to ordering materials, submit to the Commissioner samples, certifications, manufacturer's product data and certified test results for materials as specified below for approval in conformance with the requirements of this Specification. No materials may be ordered or delivered until the required submittals have been reviewed and approved by the Commissioner. Delivered materials must closely match the approved samples. Approval does not constitute final acceptance. Commissioner reserves the right to reject, on or after delivery, material that does not meet these Specifications. Contractor will be responsible for recognizing that these critical project materials warrant timely and serious attention, and that testing process to achieve approved materials should be considered a lead time item, and under no circumstance will failure to comply with specification requirements be an excuse for "staying on project construction schedule."
- B. Product Data: submit most recent printed information from manufacturer.
1. Organic Material: identify the material(s) from of which is it composed and identify the location where material was composted.
 2. Fertilizers
 3. Ground Limestone
 4. Superphosphate
- C. Samples: Submit 1 gallon planting soil samples in two phases. Submit samples concurrent with horticultural soil test reports in both phases. Submit as phase one, planting soil base components for approval. Only after approval of phase one components, submit as phase two, soil blend mixes / mediums for approval. Each sample must be a composite of a minimum of ten (10) individual samples taken from representative portions of a pile or source combined, thoroughly mixed, and bagged. Delivered materials must closely match the approved samples.
1. Planting Soil Base Components:
 - a. Base Loam
 - b. Organic Material
 - c. Sand
 2. Horticultural Soils:
 - a. Plant Bed Soil
 - b. Horticultural Subsoil
 3. Submittals of Planting Mediums: After mixing, each medium must be sampled, tested for gradation and organic content, electrical conductivity, nutrients, porosity, and pH, and approved prior to delivery to the job site.
 - a. Sources for Soil Components and Soil Mixes: Submit information identifying sources for all soil components and the firm responsible for mixing of soil mixes.
 - b. Commissioner has the right to reject any soil supplier.
 - c. Soil mix supplier must have a minimum of three (3) years' experience at supplying custom planting soil mixes.
 - d. Ensure that the accepted supplier is able to provide sufficient quantities of materials and mixes for the entire project.
- D. Soil Test Reports: Submit reports in two phases. Submit reports concurrent with samples in both phases. Submit as phase one, reports for planting soil base components above for approval. Only after approval of phase one components, submit as phase two, reports for soil blend mixes / mediums for approval. Test results must be less than 60 days old and represent materials that are available for delivery to the site in the quantity required.



- E. Submit reports for each of the above samples: Submit sample from each proposed source for testing and approval. Deliver samples to both the testing laboratory and pay costs. Send report directly to Commissioner.
1. Testing for Base Loam, Plant Bed Soil and Horticultural Subsoil.
 - a. Inform testing agency soil test is for both tree and shrub planting and lawn applications.
 - b. Mechanical and chemical analysis must be conducted by a public extension service agency or a certified private testing laboratory in accordance with the current “standards” of the American Society of Agronomy.
 - c. Gradation tests must be by combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition.
 - d. Test for agricultural suitability analysis including:
 - i. Particle size and characteristics
 - ii. Soil pH by water pH and buffer (smp) pH tests.
 - iii. Percentage organic content
 - iv. Nitrate nitrogen
 - v. Ammonium nitrogen
 - vi. Phosphorus
 - vii. Potassium
 - viii. Calcium
 - ix. Aluminum
 - x. Magnesium
 - xi. Manganese
 - xii. Micronutrients
 - xiii. Toxins including but not limited to lead, cadmium, arsenic, and mercury.
 - e. Test results: test data and recommendations for soil amendments including but not limited to nitrogen, phosphorus, potassium and limestone.
 - f. Testing for Organic Amendment Materials
 - i. Tests must be by combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition.
 - ii. Test for agricultural suitability analysis as defined in Article 2.02 – Organic Amendment Materials (Compost).
 - g. Testing for Sand
 - i. Test for particle size gradation and pH.

1.7 QUALITY ASSURANCE:

- A. Refer to DDC General Conditions Section 01 40 00 “Quality Requirements”.
- B. Qualifications for Horticultural Soil Installations:
 1. Work of horticultural planting soil installation must be performed with personnel familiar and experienced with horticultural soil preparation and related requirements associated with lawn and planting installations under the supervision of a foreman experienced in landscape work.
- C. Qualifications for Inspecting and Testing Horticultural Materials: Qualifications of Contractor’s Agricultural Chemist / Testing Laboratory / Agency must be submitted to and approved by the Commissioner prior to start of procurement of soil materials, placing or amending planting soil materials, and planting operations on Project.



1. Agricultural Chemist: Experienced person or persons employed by public or private soils testing laboratory, qualified and capable of performing tests, making soil recommendations, and issuing reports as specified herein.
 2. Soils Testing Laboratory: An independent laboratory with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed and capable of making soil recommendations and issuing reports as specified herein.
- D. Acceptable Planting Soil Materials Testing Laboratories:
1. Hummel & Company, Inc.
35 King Street, P.O. Box 606, Trumansburg, NY 14886
(607) 387 5694 – phone; (607) 837 9499.
 2. Soil Testing Laboratory
Rutgers, The State University
ASB II
57 US Highway 1 South
New Brunswick, NJ 08901-8554
 3. Agricultural Analytical Services Laboratory
University of Massachusetts West Experiment Station,
Amherst Massachusetts, 01003,
(413) 545-2311 – phone; (413) 545-1931.
 4. Woods End Research Laboratory
PO Box 297, Mt. Vernon, Maine 04352
(207) 293 2457 – phone; (207) 293 2488.
 5. Soil and Plant Tissue Testing Laboratory
West Experiment Station
682 North Pleasant Street
University of Massachusetts
Amherst, MA 01003
 6. Or approved equal.
- E. Pre-Installation Conference: A pre-installation conference must be held prior to commencement of field operations to establish procedures to maintain optimum working conditions, to coordinate requirements for testing, and to coordinate this Work with related and adjacent work.
- F. Inspections and Testing of Horticultural Soil Materials: the following conditions and requirements apply:
1. Material Testing, General: Contractor will engage and pay for the services of a qualified Agricultural Chemist / Soils Testing Laboratory / Agency to perform all materials testing and inspections of Project-related Base Components and Planting Soils, as well as any other material testing and soil mix material testing required in this Section or additionally required by the Commissioner.
 2. On-site Quality Control Testing and Inspections: Soil placement, and other earthwork will be subject to quality control inspections and testing by Commissioner.
 - a. Contractor will cooperate in obtaining samples and performing tests of in-place materials and furnish incidental field labor in connection with any tests to be performed by the Testing Laboratory / Agency.
 3. Construction Monitoring:
 - a. During landscape construction operations the Commissioner may be present at the site to observe and monitor placing and amending soil material operations and will be permitted free and unrestricted access to the site and work.



- b. Commissioner reserves the right to take and analyze at any time such additional samples of horticultural soil and soil amendment materials as deemed necessary for verification of conformance with the Contract Documents. The Contractor must furnish samples for this purpose upon request and perform material testing as requested. The Commissioner may, at their discretion, take additional tests or order additional tests made by the Contractor's Testing Laboratory/Agency respective to conditions.
 - c. Based on observations and evaluation of quality control tests, the Contractor's Testing Laboratory/Agency will make recommendations to the Commissioner regarding conformance of the soil material and placing operations to Contract Documents and compatibility of actual subsurface conditions to required subsurface conditions.
 - d. Commissioner will evaluate the recommendations of respective Testing Laboratory/Agency and will judge the compliance of the work with Contract Documents or advise the Contractor to direct remedial work where the completed work does not comply with Contract Documents.
 - e. Planting Soils and/or other components delivered to the site may be periodically sampled and tested for compliance. Materials not matching the approved previously submitted Samples will be removed from site at no additional cost to the City of New York.
4. Materials in question will not be used, pending test results of conformance to specified requirements.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Packing and Shipping: deliver materials in unopened containers bearing manufacturer's name and guaranteed statement of analysis. Transport materials without damage. Protect finishes from abrasion, dirt, oils, grease, and chemicals. Pack materials to protect from weather.
- B. Base Components and Planting Soils must not be handled, hauled, or placed when wet, during or immediately after a heavy rainfall, or frozen. Soil should be handled only when the moisture content is less than or equal to the optimum water content as determined for the Standard Proctor test. The Commissioner will be consulted to determine if the soil is too wet to handle.
- C. Store and handle packaged materials in strict compliance with manufacturer's instructions and recommendations. Protect all materials from weather, damage, injury, and theft.
- D. 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.
- E. Prohibit vehicular and pedestrian traffic on or around stockpiled planting soil.
- F. 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. Provide all means and methods required to prevent anaerobic conditions at no additional cost to the City of New York.
- G. 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.
- H. Work and Protection Plans:
 - 1. On-Site Soil Storage: Submit proposed locations and means and methods for storage/stockpiling of soil materials on-site.



2. Soil Placement, and Settlement Plans: Submit a plan of implementation with a schedule describing the proposed methods intended for placing horticultural planting soils and for allowing natural settling of installed soils.

I. Data Submitted for Information and Reference:

1. Copies of permits necessary to transport materials off site.
2. Location of legal disposal sites for waste materials from this work of Project, if any.

1.9 PROJECT/SITE CONDITIONS

A. Environmental Requirements: do not deliver or handle soils when dry, wet, or frozen.

1. No planting Soil may be trucked, placed, compacted, or otherwise handled when its moisture content is greater than optimum as determined by ASTM 698. In addition, no soil may be compacted if its moisture content is sufficiently high that its saturated hydraulic conductivity falls below its minimum rate as specified below. Normally, but not always, this requirement will be met when the moisture content is at or below optimum. The Contractor must conduct moisture content tests using the Speedy Moisture Test or other approved Equipment as necessary to ensure conformation with maximum allowable moisture contents. The Contractor must coordinate his procedures to allow for drying of planting soils that exceed maximum allowable moisture contents.
2. Additional Field Tests
 - a. Form soil in palm of hand, if soil retains shape and crumbles upon touching, the soil may be worked.
 - b. If the soil will not retain shape, it is too dry and should not be worked.
 - c. If the soil retains shape and will not crumble, it is too wet and should not be worked.
 - d. If the soil glistens or free water is present after lightly patting the sample, the soil is too wet and should not be worked

PART II -PRODUCTS

2.1 ENGINEERED SOIL MANUFACTURERS:

- A. WeCare Organics LLC, Hillburn, NY
- B. Long Island Compost Corp, Westbury, NY
- C. Nature's Choice, Hillsborough, NJ
- D. EME, Inc, New Egypt, NJ
- E. Or approved equal.

2.2 BASE LOAM:

- A. Base Loam must be imported and 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 mixed 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:



U.S. Sieve Size Number	Percent Passing	
	Minimum	Maximum
10	---	100
18	85	100
35	70	95
60	50	85
140	36	57
270	32	60
0.002mm	3	15

- B. Base loam with more than 46% passing the 270 sieve or with more than 6 percent clay must have a well-developed and stable crumb (ped) structure as determined by an agricultural chemist.
- C. Maximum size must be one-inch largest dimension. The maximum retained on the #10 sieve must be 20% by weight of the total sample.
- D. The organic content must be between 4.0 and 8.0 percent.
- E. The pH must be 7.2 or less.

2.3 ORGANIC MATERIAL (COMPOST):

- A. Organic Material (Compost) as Amendment for Soil Mediums:
 - 1. Organic Material (Compost) for amending planting medium: stable, humus-like material produced from the aerobic decomposition of organic residues consisting of Leaf or Yard Waste Compost which must have been composted for a minimum of one year (12 months). Compost must be free of debris such as plastics, metal, concrete or other debris and stones larger than 1/2", larger branches and roots and wood chips over 1/2" in length or diameter. Compost must be a dark brown to black color and be capable of supporting plant growth with appropriate management 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. Stability tests must be conducted by Woods End Research Laboratory, Mt. Vernon, Maine, Soil Control laboratory of California, or TPS Laboratories of Texas, or approved equal.
 - c. Pathogens/Metals/Vector Attraction reduction must meet all State of New York requirements for applications to soils with human activity.
 - d. Organic Content: 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 or H₂O₂ for particles passing a Number 10 sieve according to procedures performed by the West Experiment Station at the University of Massachusetts, Amherst, Hummel & Company, Trumansburg, NY, or Rutgers Soil Testing Laboratory, New Brunswick, NJ, or equal. For loss by ignition, a 50-cc sub-sample of the screened and mixed compost is ground to pass the number 60 sieve. Two to three grams (\pm 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: 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. Compost: screened to 1/2-inch maximum particle size and must contain not more than 3 percent material finer than 0.002mm as determined by hydrometer test on ashed material.
- h. Nutrient content: 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, Chromium, Iron, Manganese, Lead, Soluble Salts, Cation Exchange Capacity, soil reaction (pH), buffer pH, and micronutrients.

2.4 SAND

A. Sand as Amendment for Soil Mediums

1. Sand must be uniformly graded medium to coarse sand consisting of clean, inert, rounded grains of quartz or other durable rock and free from loam or clay, surface coatings, mica, other deleterious materials with the following gradation.

U.S. Sieve Size Number	Percent Passing	
	Minimum	Maximum
10	100	-
18	65	90
35	35	60
60	15	30
270	0	8
270	0	3
0.002mm	0	0.5

2. Maximum size must be one-inch largest dimension. The maximum retained on the #10 sieve must be 15% by weight of the total sample.
3. The ratio of the particle size for 70% passing (D70) to the particle size for 20% passing (D20) must be 3.0 or less. ($D70/D20 < 3.0$)
4. Saturated hydraulic conductivity of the sand must be not less than 30 inches per hour, according to ASTM D5856-95 (2000), when compacted to a minimum of 90% Standard Proctor, ASTM 698.
5. The pH must be less than 7.5

2.5 PLANTING SOIL

- A. Base Loam, Sand and Compost, each as specified above, must be combined in an approximate mix ratio of one part by volume Sand to one part by volume Base Loam to one part by volume Compost (1S:1.0L:1C) to create a uniform blend which meets the following requirements.

B. Gradation for Material Passing the Number 10 Sieve:

U.S. Sieve Size Number	Percent Passing	
	Minimum	Maximum



10	100	-
18	73	90
35	54	74
60	33	53
140	22	34
270	18	24
0.002mm	2.5	6

1. Maximum size must be one-inch largest dimension. The maximum retained on the #10 sieve must be 20% by weight of the total sample.
2. Ratio of the particle size for 80% passing (D₈₀) to the particle size for 30% passing (D₃₀) must be 8 or less. (D₈₀/D₃₀ <8)
3. Saturated hydraulic conductivity of the mix: not less than 2 inches per hour according to ASTM D5856-95 (2000) when compacted to a minimum of 86% Standard Proctor, ASTM 698.
4. Organic content: between 5.0 and 7.0 percent by weight.

2.6 HORTICULTURAL SUBSOIL

- A. Base Loam, Sand and Compost, each as specified above, must be combined in an approximate mix ratio of three parts by volume Sand to three parts by volume Base Loam to 1.0 part by volume Compost (3.0S:3.0L:1.0 Compost) to create a uniform blend which meets the following requirements.

- B. Gradation for Material Passing the Number 10 Sieve:

U.S. Sieve Size Number	% Passing by Weight	
	Minimum	Maximum
10	100	-
18	70	90
35	50	74
60	27	48
140	18	28
270	16	22
0.002mm	2	6

1. Maximum size must be one-inch largest dimension. The maximum retained on the #10 sieve must be 20% by weight of the total sample.
2. Ratio of the particle size for 80% passing (D₈₀) to the particle size for 30% passing (D₃₀) must be 6.5 or less. (D₈₀/D₃₀ <6.5)
3. Saturated hydraulic conductivity of the mix: not less than 3 inches per hour according to ASTM D5856-95 (2000) when compacted to a minimum of 86% Standard Proctor, ASTM 698.
4. Organic content: between 2.0 and 3.5 percent by weight.

2.7 PRE-PLANT FERTILIZER

- A. Complete, fertilizer made from all-natural ingredients complying with State and Federal fertilizer laws. Fertilizer must contain the following available plant food by weight, unless soils tests indicate a need for different composition:

Nitrogen	Phosphorus	Potash
----------	------------	--------



Deciduous Trees and Shrubs	2%	3%	3%
Evergreen Trees and Shrubs	2%	3%	3%

B. Fertilizer: a 2-3-3 N-P-K ratio, slow-release fertilizer.

C. Fertilizer to be delivered in original unopened standard size bags showing weigh, analysis ingredients and manufacturer's name.

2.8 SOIL AMENDMENTS

A. Superphosphate: finely ground phosphate rock, commonly used for agricultural purposes and must contain not less than 20 percent available phosphoric acid.

B. Ground Limestone: dolomitic limestone and contain not less than 50 percent of total carbonates and 25 percent total magnesium with a neutralizing value of at least 100 percent. Material must be ground to such fineness that 40 percent will pass 100 mesh U.S. standard sieve and 98 percent will pass through 20 mesh U.S. standard sieve.

2.9 EQUIPMENT

A. Chisel Plow or disk harrow or bucket of backhoe: for subsoil cultivation.

B. Rotovator or disk harrow: for planting mixture/soil cultivation.

2.10 WATER

A. Water: furnished by Contractor, unless otherwise specified, and suitable for irrigation and free from ingredients harmful to plant life. Hose and other watering equipment furnished by Contractor.

PART III - EXECUTION

3.1 EXECUTION REQUIREMENTS

A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

A. Verification of Conditions: in the event field conditions are not as shown on Drawings and outlined in the Specifications, notify Commissioner in writing.

1. Spot and Invert Elevations: verify field elevations of site improvements such as drainage and utility fixtures, pavements, existing plantings, and subsurface piping conform to drawings.
2. Rough grade: verify specified elevations and prior earthwork operations have shaped, trimmed, and finished rough grade.

3.3 PREPARATION

A. Protection:



1. Contractor to clear working areas with dig net prior to doing excavation on site. If work is to be done around underground utilities, appropriate authority of utility must be notified of impending work. Hand excavate areas adjacent to utilities. Contractor will be responsible for damages done by the Contractor or the Contractor's personnel to existing utilities, which will be repaired or paid for by Contractor.
2. Prior to installation field locate and protect from damage site improvements such as drainage and utility fixtures, pavements, and existing plantings.
3. Dust Control: upon acceptance of finish grade provide dust control.
4. Erosion Control: upon acceptance of finish grade provide erosion control.
5. Agricultural Chemicals: protect site improvements from contact with agricultural chemicals, soil amendments, and fertilizers.

3.4 PREPARATION OF PLANTING MEDIUM FOR PLANTING BEDS

- A. Correct deficiencies in soil as directed by soil test results. Thoroughly incorporate amendments into planting mixture to ensure even distribution.
- B. Incorporate pre plant fertilizer at a rate of 30 pounds per cubic yard of planting bed medium. Amendment rate will be 6 times square foot application rate per cubic yard of planting mixture.

3.5 SUBGRADE INSPECTION AND PERCOLATION TESTING

- A. For off-structure areas, after subgrade levels have been reached, the Commissioner will inspect soil conditions to evaluate subsurface drainage conditions. If required, the Contractor will carry out up to 4 standard septic percolation tests in locations identified by the Commissioner. Locations where percolation rates are less than 0.5 inches per hour will be evaluated for possible installation of subsurface drainage or deep decompaction.

3.6 DECOMPACTION OF PLANTING AREAS

- A. After subgrade levels have been inspected and tested, and immediately prior to placing Planting Soils, loosen the entire subgrade area to a minimum depth of four inches utilizing the bucket of a backhoe or equivalent equipment.
- B. Using a wide-track bulldozer size D-5 or smaller, compact the scarified subgrade to approximately 84% - 86% compaction ASTM 698 Standard Proctor. Contractor will provide shovel dug test pits to the full depth of the decompaction, where located per the direction of Commissioner, in order for Commissioner to review whether the work has been completed. Backfill the pits after the review(s).
- C. After the soils have been loosened, inspected and written approval has been provided, Planting Soils may be spread by using a wide-track bulldozer size D-5 or smaller or may be dumped and spread with the bucket of a backhoe from the edge of the loosened area. No rubber-tired equipment or heavy equipment except for a small bulldozer must pass over the subsoils (subgrade) after they have been loosened. If Contractor plans to utilize such areas for use of heavy equipment, this work should be carried out prior to beginning the process of loosening soils or filling in that area, or it will have to be rescarified and meet this specification requirement.

3.7 PREPARATION OF TREE PITS



- A. After tree planting pits have been excavated to the dimensions shown on the plans, the entire bottom area of the pit must be loosened to a minimum depth of four inches utilizing the bucket of a backhoe or equivalent equipment. The entire loosened area must then be compressed lightly with the bucket of the backhoe. The middle portion of the pit, beneath the rootball, must be compressed adequately to support the rootball and prevent settlement.

3.8 PLACEMENT OF HORTICULTURAL SUBSOIL

- A. In plant beds place and spread Horticultural Subsoil in lifts not greater than twelve inches and compact to a density between 82 and 85 percent Standard Proctor Maximum Dry Density. The surface area of each lift, including the subgrade after it has been compacted, must be scarified by raking prior to placing the next lift.
- B. Place and spread horticultural subsoil to a depth greater than required such that after settlement, finished grade conforming to the lines, grades and elevations shown on the Drawings. Ensure proper drainage in an uninterrupted pattern free of hollows and pockets.
- C. Remove stiff clods, lumps, brush, roots, stumps, litter and other foreign material and stones over one inch in diameter and dispose of legally off site.

3.9 PLACEMENT OF PLANT BED SOIL

- A. Over Horticultural Subsoil Layer, place and spread Planting Bed Medium in lifts not greater than twelve inches and compact to a density between 80 and 83 percent Standard Proctor Maximum Dry Density. The surface area of each lift, including the subgrade after it has been compacted, must be scarified by raking prior to placing the next lift.
- B. Place and spread planting medium to a depth greater than required such that after settlement, finished grade conforming to the lines, grades and elevations shown on the Drawings. Ensure proper drainage in an uninterrupted pattern free of hollows and pockets.
- C. Remove stiff clods, lumps, brush, roots, stumps, litter and other foreign material and stones over one inch in diameter and dispose of legally off site.

3.10 FIELD QUALITY CONTROL

- A. Tests: after soil preparation operations are complete and prior to planting, take soil sample for testing and recommendations as established in Article 1.6 - Submittals.
- B. Confirm that the subgrade is at the proper elevation and that no further earthwork is required to bring the subgrade to proper elevations. Subgrade layer elevations must slope parallel to the finished grade as shown on the Contract Documents. Provide a written report to the Commissioner that the subgrade has been adjusted to the required elevations to provide a uniform thickness of planting media across the area. Perform no work of placing and spreading soil until elevations have been confirmed and written report has been accepted by the Commissioner.
- C. As provided in Article 1.9 – Project / Site Conditions, no base materials or soil medium must be handled, planted, or seeded in any way if it is in a wet or frozen condition. A moist soil medium is desirable for planting.



D. Observation: Commissioner to review in the field soil preparation operations:

1. Preparation of beds.
2. Installation of soil media.

3.11 CLEANING

A. Clean up debris generated under work of this section.

B. Site Improvements

1. Wash and sweep clean site improvements such as drainage and utility fixtures, pavements, existing plantings, and site furnishings.
2. Clean site furnishings of soil, mud, and other debris.

3.12 PROTECTION

A. Protect work of this section until Final Acceptance.

B. Select equipment and otherwise phase the installation of the Soil Medium to ensure that wheeled equipment does not travel over prepared subsoil, placed fills or ordinary borrow or already installed soil. Movement of tracked equipment over said soils will be reviewed and considered for approval by the Commissioner. If it is determined by the Commissioner that wheeled equipment must travel over already installed soil, provide a written description of sequencing of work that ensures that compacted soil is loosened and uncompacted as the work progresses or place one-inch (25 mm) thick steel plate ballast (or equivalent ballast approved by the Commissioner) over the length and width of any travel way to cover Soil Medium to protect it from compaction.

C. Disturbed areas outside the limit of work must be protected and as required, graded smooth and spread with Soil Medium to meet finished grades.

D. Soil Mediums delivered to the site must be protected from erosion. Materials must be spread immediately. Otherwise, materials that set on site for more than 24 hours must be covered with tarpaulin or other soil erosion system acceptable to the Commissioner.

3.13 ACCEPTANCE

A. Confirm that the final grade of the Soil Mediums is at the proper finish grade elevations. Adjust grade as required to meet the contours and spot elevations noted on the Plans. Request the presence of the Commissioner to inspect final grade. Do not proceed with the remaining work of this Contract until the Commissioner has given his/her written approval of the final grade.

3.14 WASTE MANAGEMENT

A. Separate and dispose of waste in accordance with the Project's Waste Management Plan.

END OF SECTION 32 91 00



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. Furnishing and installation of all Landscape plantings
 - 2. Soil Amendments
 - 3. Tree Stabilization
 - 4. Tree Irrigation Bags
 - 5. Mulch
 - 6. Miscellaneous Products
 - 7. Pruning
 - 8. Pest and disease control
 - 9. Maintenance under Contract
 - 10. Guaranty
- B. Related Sections
 - 1. Section 32 80 00 for Irrigation
 - 2. Section 32 91 00 for Planting Preparation

1.3 REFERENCES

- A. Tree and shrub transplanting manual, latest edition, International Society of Arboriculture (I.S.A.).
- B. American Standard for Nursery Stock, ANSI Z60.1, latest edition, American Association of Nurserymen, Inc.

1.4 ABBREVIATIONS

- A. Cal. Indicates the caliper of the trunk of the tree.
- B. B & B Indicates tree or shrub to be balled and burlapped.
- C. B.R. Indicates a tree or shrub to be delivered "bare root".
- D. Cont. Indicates tree or shrub to be container grown.
- E. O.C. Indicates "on center" or spacing between plants in all directions.



- F. HT. Indicates overall height of tree.

1.5 DEFINITIONS

- A. Backfill: Soils used to replace or the act of replacing earth in an excavation.
- B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.
- C. Balled and Potted Stock: Plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required.
- D. Bare-Root Stock: Plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than minimum root spread according to ANSI Z60.1 for type and size of plant required.
- E. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Containers must be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.
- F. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.
- G. Fabric Bag-Grown Stock: Healthy, vigorous, well-rooted plants established and grown in-ground in a porous fabric bag with well-established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60.1 for type and size of plant.
- H. Finish Grade: Elevation of finished surface of planting soil.
- I. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- J. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- K. Pests: Living organisms that occur where they are not desired, or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- L. Planting Area: Areas to be planted.
- M. Planting Soils: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to



produce a soil mixture best for plant growth. See Section 32 91 00 Planting Soils.

- N. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, perennials, bulbs, corms, tubers, or herbaceous vegetation.
- O. Root Flare: Also called "trunk flare." The area at the base of the plant's stem (trunk) where the stem broadens to form roots, the area of transition between the root system and the stem or trunk.
- P. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees at or below the soil surface or within the root ball or container, which will, over time, constrain healthy plant growth and the long-term viability of the tree.
- Q. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.
- R. Subsoil: All soil beneath the topsoil layer of the soil profile, typified by the lack of organic matter and soil organisms.
- S. 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.

1.6 SUBMITTAL PROCEDURES

- A. Refer to DDC General Conditions Section 01 33 00 "Submittal Procedures".

1.7 SUBMITTALS

- A. Notice of intent to perform work must be submitted to the Commissioner at least 14 calendar days prior to planting.
 - 1. Within fifteen (15) calendar days after Notice to Proceed, submit to Commissioner invoices or certificates of deposit from nursery(ies) confirming timely delivery of all specified and tagged plant materials. Indicate the following:
 - a. Confirmed plant species (and cultivar), size and grade of materials to be planted.
 - b. Source of origin and health of plant materials for each type.
 - 2. If any plant materials are unavailable at the time of submittal, Contractor must contact Commissioner to determine acceptable alternatives.
 - 3. Submit a schedule itemizing the landscape planting work to be performed to the Commissioner. This schedule must be submitted within fifteen (15) calendar days after Contract Notice to Proceed.
 - a. Include in this schedule, anticipated dates for commencement and sequencing of landscape planting work, including, but not limited to, selections and tagging, layouts and layout approval, placement of trees, and commencement of the maintenance period.
- B. Product Data:
 - 1. Submit to the Commissioner technical descriptive data for each manufactured or packaged product of this Section. Include manufacturer's product testing and analysis and installation instructions for manufactured or processed items and materials.



C. Plant Material:

1. **Plant Sources:** Submit to Commissioner a list of sources clearly stating plant material species, cultivar, size, form, and quantities available at each nursery.
2. **Photographic Documentation:** The contractor must provide digital photographs for each required species, cultivar showing size and condition for review by the Commissioner to determine that the plant material meets the requirements of the specifications and drawings.
 - a. Take photographs from an angle depicting true size and condition of the typical plant to be furnished.
 - b. Include a scale rod or other measuring device in each photograph. For species where more than 20 plants are required, include a minimum of three photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished.
 - c. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.

D. Certificates:

1. Furnish to Commissioner certification that each tree is true to name and in conformance with these Specifications. All nurseries supplying material are required to have a registration certificate from the Department of Agriculture and Markets, Division of Plant Industry, New York, or any other state where plant material is obtained, certifying that plant material is apparently free of injurious insects and diseases.
2. Furnish to Commissioner certificates/cultivars by supplying nursery.
3. Prior to the use on site of any chemical insect or disease control materials, submit to Commissioner a list of the control materials and quantities intended for use in controlling insects and disease prevalent and expected on the site. Submittal must include data demonstrating the compatibility of the control materials and methods of installation or application with the specified planting types and varieties. The use of any chemical insect or disease control materials will not be allowed except by written approval and consent of Commissioner.
4. If any chemical insect or disease control materials are to be used, they must be applied prior to the tree's delivery to the site. No chemical insect or disease control materials are to be applied on-site.

E. Samples for Verification: For each of the following:

1. **Shredded Bark Mulch:** 1 Quart volume of each organic mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each Sample must be typical of the material to be furnished, and provide an accurate representation of color, texture, and organic makeup.
2. **Mineral Mulch:** 1 lb. each mineral mulch required, in sealed plastic bags labeled with source of mulch. Sample must be typical of the material to be delivered and installed on the site, and provide an accurate indication of color, texture, and makeup of the material.

F. Soil Tests: Where planting is to occur in existing soils provide soil test for each identifiable soil type on the project site, as designated on the plans. Test results must identify soil characteristics and include recommendations for amendments suitable for proposed plantings.

1.8 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified landscape Installer.



- B. Planting Establishment Plan: Schedule of routine activities to be carried out by Contractor during the guaranty period in order to successfully establish plantings. Submit before start of required maintenance periods.
- C. Guaranty: refer to Schedule B Addendum to the General Conditions.

1.9 QUALITY ASSURANCE

- A. Refer to DDC General Conditions Section 01 40 00 "Quality Requirements".
- B. Installer Qualifications: A qualified landscape subcontractor whose work has resulted in successful establishment of plants in projects similar in size, scope, and character.
 - 1. Experience: three (3) years' experience in landscape installation in addition to the minimum requirements in DDC General Conditions "Quality Requirements."
 - 2. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 - 3. Pesticide Applicator: New York State licensed, commercial.
- C. Soil-Testing Laboratory Qualifications: An independent or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.
- D. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of the soil.
 - 1. Testing methods and written recommendations must comply with USDA's Handbook No. 60.
 - 2. The soil-testing laboratory will oversee soil sampling; with depth, location, and number of samples to be taken per instructions from Commissioner. A minimum of three representative samples must be taken from varied locations for each soil to be used or amended for planting purposes.
 - 3. Report suitability of tested soil for plant growth.
 - a. Based upon the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. or volume per cu. yd. for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
 - b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.

1.10 REGULATORY REQUIREMENTS

- A. Procure and pay for permits and licenses required for work of this section.

1.11 PROJECT/SITE CONDITIONS

- A. Schedule the work in a cooperative manner in order to give the least possible interference or annoyance to other trades.



- B. Construction Sequencing: Planting will take place only after the installation of edging and pavement materials.
- C. The Contractor will be responsible for pedestrian and vehicular safety and control within the work site, and will provide the necessary warning devices and ground personnel needed to give safety, warning and protection to persons and vehicular traffic within the area.
- D. During site preparation, planting and after care, the Contractor will be responsible for all damage to existing features above and below ground (benches, utility lines, irrigation pipes, lampposts, path surfaces) incurred as a result of work operations. Repairs and/or replacements of damaged items will be made to the satisfaction of the Commissioner.
- E. Environmental Requirements and Planting Schedule:
 - 1. Do not plant when the ground is frozen, excessively wet, or the soil is otherwise in an unsatisfactory condition for planting.
 - 2. Plant only within the following dates, weather permitting:
 - a. The Spring Season for all planting materials is the period from March 1 through May 15.
 - b. The Fall Season is divided into two parts, made necessary by the handling characteristics of two plant types.
 - 1) September 1 through October 15 is the fall planting season for deciduous and evergreen materials.
 - 2) October 15 through December 1 is the fall planting season for deciduous materials only.
- F. Environmental Requirements for Soils:
 - 1. Soil mixes may not be handled, hauled or placed during rain or wet weather or when near or above field capacity.

1.12 PLANT MATERIAL INSPECTION

- A. Plants are subject to inspection and approval by Commissioner at the place of growth and again upon delivery and prior to planting for conformity to specification requirements as to quality, size, and variety. Such approval will not impair the right of rejection due to damage suffered in handling, transportation and/or planting. Rejected plants must be removed immediately from the site. Inspection outside the State of New York or beyond a 90-mile radius from the site will be made at the expense of the Contractor.
- B. Written requests for inspection of plant material at their place of growth must be submitted to the Commissioner at least 14 days prior to digging. The Commissioner may refuse inspection if in his/her judgment an insufficient quantity of plants is available for inspection. The Contractor will, at his expense, supply the Commissioner with such labor and assistance as may be necessary in the handling of material for proper inspection.
- C. Inspection of plant materials for spring planting will occur during the previous fall season, or at a time prior to planting when sufficient plant growth has occurred to assess and evaluate plant species, size, and condition.
- D. Tagging of trees will be as follows: if such quantities exist, for every 20 trees planted, 22 trees will be tagged assuring appropriate replacement for (a) trees damaged prior to transplanting and (b) trees requiring



replacement under terms of the guaranty.

1.13 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Packaged Materials: Deliver packaged materials in unopened bags or containers, each clearly bearing the name, and trademark of the producer, material composition, manufacturers' certified analysis, and the weight of the material.
- B. Plant Material, Conditions of Moving and Delivery:
 - 1. The use of an anti-desiccant is not permitted except by written approval and consent by Commissioner.
 - a. If approved, spray deciduous plants with an anti-desiccant, immediately before moving plant material from its source, applying an adequate film over trunks, branches, twigs, and foliage.
 - b. Approval is required for any subsequent instance of use.
 - 2. Dig and handle plants with care to prevent injury to trunks, branches, and roots.
 - 3. All plants must be dug immediately before moving unless otherwise specified. All plants must be dug to retain as many fibrous roots as possible.
 - 4. Balled and burlapped and balled and platformed plants must have a solid ball of earth of minimum specified size, securely held in place by burlap and stout rope or twine. Loose, broken, or manufactured balls will be rejected.
 - 5. Bare root plants must be puddled immediately after digging by immersing the roots in a hydrogel slurry, so as to completely coat the roots.
 - 6. Do not prune prior to delivery. Do not bend or bind-tie trees in such manner as to damage bark, break branches or destroy natural shape. Pack and ship in order to ensure arrival at the site in good condition. Provide protective covering during delivery. No plants will be accepted if the rootball is cracked or broken, or trunks scarred, or branches broken.
 - 7. Plant Materials:
 - a. Plants must be packed, transported, and handled with utmost care to ensure adequate protection against injury. When transported in closed vehicles, plants must receive adequate ventilation to prevent sweating. When transported in open vehicles, plants must be protected by tarpaulins or other suitable cover material.
 - b. Deliver after preparations of planting areas have been completed and approved and place plants immediately.
 - c. If planting is delayed more than 24 hours after delivery, set balled and burlapped plants on the ground in a "shade house", erected by Contractor, with rootballs well protected with soil, wet peat, or other acceptable material. Protect balls and roots from freezing, sun, drying winds, and/or mechanical damage. Water as necessary until planted.
 - d. Bare root plants, when specified, must be adequately protected from drying out by covering the roots with moist burlap and plastic tarps and must be planted within 2 weeks of being dug.

1.14 GUARANTY PERIOD AND REPLACEMENTS

- A. The guaranty period for all new Landscape Plantings is defined in Schedule B, Addendum to the General Conditions.
- B. All plant material must be in good, healthy and flourishing condition, throughout and at the conclusion of the period specified in Schedule B, Addendum to the General Conditions.



- C. When work is accepted in parts, the guaranty periods will be determined by Schedule B, Addendum to the General Conditions.
- D. The Contractor will replace, without cost, as soon as weather conditions permit, and within a specified planting period, all plants determined dead and/or dying by the Commissioner during and at the end of the guaranty period.
 - 1. Plants must be free of dead or dying branches and must bear foliage of normal density, size, and color.
 - 2. Trees having lost their central leader or exhibit crown dieback at the end of the guaranty must be replaced.
 - 3. Replacements must match the adjacent specimens of the same species. Replacements will be subject to all requirements stated in this specification and in Schedule B, Addendum to the General Conditions.
- E. The Contractor will make periodic inspections, at no extra cost, during the guaranty period to determine what changes, if any, should be made in the maintenance program. Any recommended changes must be submitted in writing to the Commissioner.

PART 2 PRODUCTS

2.1 PREINSTALLATION CONFERENCE: Conduct conference at Project site.

2.2 PLANT MATERIAL

A. General Requirements

- 1. The Contractor will furnish and plant all plants as specified and in the quantities listed.
- 2. All plants must be nursery grown. Plant material dug from the wild will be rejected.
- 3. Plants must be true to species and cultivar specified. Certification of cultivars by supplying nursery must be supplied in writing to Commissioner.
- 4. Plants must be in accordance with the American Nurserymen Association Standards in all ways, unless otherwise specified in writing by Commissioner.
- 5. All plants must be of specimen quality, symmetrical, so trained or favored in development and appearance as to be unquestionably and outstandingly superior in forms and compactness. Plants must indicate vigorous growth, be well branched and densely foliated when in leaf, free of disease, insects, eggs, larvae and have well developed root systems.
- 6. Trees with multiple leaders will not be accepted unless specifically indicated as 'Multistem' in the Plant Schedule.
- 7. Trees with a damaged or crooked leader, bark or abrasions, sunscald, disfiguring knots, insect damage will not be accepted.
- 8. Planting Depth: The depth of planting must be checked for all trees, at the nursery, either in the field, or, if already dug, as B&B or Container grown plants. If the root/trunk flare (the intersection of the trunk and the buttress roots), is not visible, it must be located. Remove any soil above the root/trunk flare. Any tree with significant adventitious root growth or evidence of girdling roots will be rejected. Following the removal of any excess soil above the root/trunk flare and determination that the trunk bark condition is acceptable, the tree may be dug, and the root ball secured.
- 9. Rootball size is determined from the elevation of the root/trunk flare in accordance with the American standard for nursery stock for the caliper size of the tree.



B. Plant Sizes and Dimensions

1. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.
2. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
3. Height and spread dimensions refer to the main body of the plant and not from branch tip to tip. If a range of size is given, no plant may be less than the minimum size and not less than 50% of the plants may be as large as the maximum size specified. Plants that meet measurements but do not possess a normal balance between height and spread will be rejected.
4. Plants larger than specified may be used only if approved by Commissioner. Use of such plants will not increase the unit price. If larger plants are approved, the root ball must be increased in proportion to the size of the plant, in accordance with the American standard for nursery stock.
5. Stock furnished must be a fair average of the minimum and maximum sizes specified. Larger plants cut back to sizes specified will not be accepted.
6. Container grown herbaceous plants, groundcover, and vines must be well rooted in the container size indicated on the Plant Schedule, grown in the container at least one year prior to planting. Bulbs, corms, tubers, and rhizomes must be Top Size, or as indicated on the Plant Schedule. Annual flowering plants must be vigorous, well rooted, with no indications of disease or stress.

C. Quality

1. All plants must be typical of their species or variety and have normal, well-developed branches and vigorous fibrous root systems. Plants must be sound, healthy, vigorous plants free from defects, disfiguring knots, sun scald injuries, dead or broken branches, abrasions of the bark, plant diseases, insect eggs, borers, and all forms of infestation.
 - a. Trees: All trees must be field dug, balled and burlapped. Major trees must be branched 6-7 feet from the ground, minor trees as specified. Sizes of trees must be as indicated. Rootball size must correspond to American Association of Nurserymen Standards for the corresponding caliper size. Well-branched crown and a fibrous root system are essential.
 - b. Shrubs: Sizes must be as indicated. Rootball or container sizes must correspond to A.A.N. Standards for the corresponding shrub height. Shrubs must have a well developed, heavy root system, and be well branched to the ground.
 - c. Vines, Groundcover, And Herbaceous Plants: Container size must be as indicated on the plans. All plants must have vigorous root systems and have grown in the container for at least one year prior to planting.
 - d. Plugs: Plugs must have vigorous root systems.
 - e. Annuals: Annual flowering plants must be vigorous, well rooted, with no indications of disease or stress.
 - f. Bulbs, Corms, Tubers and Rhizomes: All bulbs, corms, tubers, and rhizomes must be top size, firm, and non-desiccated, moldy, or rotted.

D. Sources

1. All plants must be sourced from reputable nurseries and be either field or container grown. All trees and shrubs must have been growing under similar climatic conditions as the project site two (2) years prior to the date of the contract. Plants held in storage will be rejected if they show signs of growth



- during storage.
2. Plant material subject to availability and adherence to the requirements of this specification, may be purchased, or, time permitting, contract grown, from:
 - a. Halka Nurseries, Millstone Twp, NJ
 - b. LP Statile Inc., Springfield Twp, NJ
 - c. Weston Nurseries, Chelmsford, MA
 - d. Hardscrabble Farms, North Salem, NY
 - e. El Hannon Nurseries, Petersburg, NY
 - f. Rosedale, Nursery, Hawthorne, NY
 - g. North Creek Nursery, Landenburg, PA
 - h. Talmage Farm, Riverhead, NY
 - i. The Plantage, Cutchogue, NY
 - j. Kurt Bluemel, Inc., Baldwin, MD
 - k. Greenbelt Native Plant Center, Staten Island, NY
 - l. Pineland Nursery, Columbus, NJ
 - m. Wild Earth, Freehold, NJ
 - n. Sylva Native, New Freedom, PA
 - o. or approved equal nurseries.
 3. Native Plants, where indicated
 - a. Native plant material must be derived from the local genotypes of the native Plants specified. For purposes of this native plant material paragraph, "local" will mean within 150 miles from the planting site. However, a reasonable effort should be made to obtain sources of plant material as close to the planting site as possible.
 - b. All plants must have been grown in a hardiness zone no warmer than Zone 7 or colder than Zone 6 as determined by the USDA Agricultural Research Service, Plant Hardiness Zone Map. Plant growth, habit, form, and quality must be typical of their species. Plant material will exhibit the range of variation typical of local genotypes of the species, have normal branching and vigorous fibrous root systems. They must be sound, healthy plants, free from sunscald injuries, or other mechanical injury, plant diseases, insect eggs, borers, and all forms of infestations. Except as may otherwise be specified in this native plant material paragraph, all other sections of this specification will also apply to the Native Plants.
 4. All plants must be nursery grown unless otherwise stated. Collected material will not be accepted.

E. Plant Material Ordering and Substitutions

1. The Contractor will notify the Commissioner of the unavailability of any tree, shrub, herbaceous plant, or bulb species designated in the contract documents.
2. Schedule permitting, and with the Commissioner's approval, plant materials may be contract grown or pre-purchased provided the species, cultivar, size, quantities, and other characteristics outlined in the Plant Schedule are satisfied at the time of planting.

2.3 PLANTING SOILS – See Section 32 91 00 Planting Preparation

2.4 SOIL AMENDMENTS

A. Mycorrhizal Fungi Inoculant

1. Three ounce (3 oz.) premeasured dry formulation packet, such as Mycor Tree Saver Transplant, as manufactured by Plant Health Care, Inc., Pittsburgh, PA; Rhizanova Tree Transplant, as



- manufactured by Becker Underwood, Inc., Ames, IA; Myco Pak, as manufactured by Tri-C Organics, Chino, CA; or approved equal.
2. Packets will contain, as a minimum: one thousand (1000) live spores of Vesicular-Arbuscular fungi, including: *Entrophospora columbiana*, *Glomus clarum*, *Glomus etunicatum*, and *Glomus* sp.; seventeen million five hundred thousand (17,500,000) live spores of Ectomycorrhizal fungi (*Pisolithus tinctorius*); Biostimulant ingredients including *Yucca schidigera* extract; soluble sea kelp extract derived from *Ascophyllum nodosum*; humic acids; and acrylamide copolymer gel as a water absorbent medium.
- B. Water Retention Additive
1. Water Retention Additives must be a granular polyacrylamide polymer of a potassium base and not a sodium base that slowly releases moisture into the root zone such as Terra Sorb, as manufactured by Plant Health Care, Inc.; Soil Moist Granular, as manufactured by JRM; Hydretain ES Plus as manufactured by Ecogel; or approved equal.
- C. Inorganic Soil Amendments
1. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:
 - a. Class: T, with a minimum of 99 percent passing through No. 8 sieve and a minimum of 75 percent passing through No. 60 sieve.
 - b. Class: O, with a minimum of 95 percent passing through No. 8 sieve and a minimum of 55 percent passing through No. 60 sieve.
 - c. Provide lime in form of ground dolomitic limestone or mollusk shells
 2. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent sulfur, with a minimum of 99 percent passing through No. 6 sieve and a maximum of 10 percent passing through No. 40 sieve.
 3. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
 4. Aluminum Sulfate: Commercial grade, unadulterated.
 5. Perlite: Horticultural perlite, soil amendment grade.
 6. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through No. 50 sieve.
 7. Sand: Clean, washed, natural or manufactured, and free of toxic materials.
 8. Diatomaceous Earth: Calcined, 90 percent silica, with approximately 140 percent water absorption capacity by weight.
 9. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.
- D. Organic Soil Amendments
1. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
 - a. Organic Matter Content: 50 to 60 percent of dry weight.
 - b. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.
 2. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.



3. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, debris, and material harmful to plant growth.
4. Sphagnum Peat and Muck Peat will not be accepted as organic amendment materials. Soils containing these materials will be rejected.

E. Fertilizers

1. Bonemeal: Commercial, raw, or steamed, finely ground; a minimum of 4 percent nitrogen and 20 percent phosphoric acid.
2. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
3. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 - a. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
 - b. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.
4. Planting Tablets: Tightly compressed chip type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets will break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.
 - a. Size: 21-gram tablets.
 - b. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.
5. Chelated Iron: Commercial-grade FeEDDHA for dicots and woody plants, and commercial-grade FeDTPA for ornamental grasses and monocots.

2.5 TREE STABILIZATION MATERIALS

A. Staking

1. Rough-sawn, sound, new cedar stakes, by diameter and length indicated, pointed at one end.
2. Flexible Ties or Straps: Polypropylene guy lines 3/4" x 12' = 800 lb test, olive drab, UV resistant
3. Flags: Standard surveyor's plastic flagging, white, 1" wide, to mark guying cables or straps.
4. For loose soil or greenroof planting conditions, use three (3) foot lengths of 4"x4" lumber as deadmen secured to the stakes in order to supplement soil anchoring.

2.6 TREE IRRIGATION BAGS – (where no irrigation is provided).

- A. Irrigation bags must be one hundred percent (100%) reinforced UV stable polyethylene, at least ten (10) mils. thick with a polyester scrim lining, such as TreeGator, as manufactured by Spectrum Products, Raleigh, NC; Leonard ArborRain Tower, as manufactured by AMLeonard; Tree Watering Bags, as manufactured by BMB Brands, Inc.; or approved equal. The irrigation bags will have a minimum twenty-gallon (20 gal.) capacity.

2.7 MULCH

- A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:



1. Shredded Bark Mulch: Acceptable mulch consists of shredded bark not exceeding three inches (3") in length and one inch (1") in width. Mulch must be a natural brown color, not dyed, and be of a uniform grade with no additives or any other treatment.
 - a. Mulch contaminated with leaves, twigs, and/or debris is not acceptable. Only mulch derived from tree material, not from wood waste products like sawdust, shredded palettes, or other debris, will be approved and accepted.

2.8 MISCELLANEOUS PRODUCTS

- A. Landscape Fabric is a one hundred percent (100%) continuous monofilament polypropylene spun bond fabric with UV inhibitors. The fabric prevents weed germination and reduce maintenance while allowing water, herbicides, and fertilizers to pass through.
- B. Manufacturers: Deep Root Xavan as manufactured by DeepRoot Partners; LP, NO. 3201 as manufactured by Typar; Professional Grade Landscape Fabric as manufactured by ECOgardner, Non-woven 4 ounce Landscape Fabric, available from A.M. Leonard, Piqua, OH, or approved equal
 1. The fabric must demonstrate the following minimum characteristics:
 - a. Area Weight (ASTM 5261): 4.0 oz./yard
 - b. Tensile Strength (ASTM D 4595): 48.57 lbs./ inch
 - c. Strength @ 5% Elongation: 22.86 lbs./ inch
 - d. Energy Absorption: 22 lbs./ inch
 - e. Grab Strength (ASTM D 4632): 167.42 psi
 - f. Burst Strength (ASTM D 3786) 166.79 psi
 - g. Tear Strength (ASTM D 4533): 83.15 lbs.
 - h. Puncture (ASTM D 4833): 56.18 lbs.
 - i. Hydraulic Properties: opening size (ASTM D 4751) 210 microns, US Sieve 70
 2. Fastening staples must be a least six (6) inches in length and made of a rust-resistant material, such as aluminum, galvanized steel, or approved equal that will adequately secure the landscape fabric to the planting bed.
- C. Pesticides – Where Called For or Required: Commissioner's written permission for use is required. Contractor must notify the Commissioner within 7 days of proposed use.
 1. General: Pesticide registered and approved by EPA, acceptable to the Commissioner, 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 the Commissioner.
 2. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.
 3. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.
- D. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.
- E. Burlap: Non-synthetic, biodegradable.



PART 3 EXECUTION

3.1 EXECUTION REQUIREMENTS

- A. Refer to DDC General Conditions for execution requirements.

3.2 EXAMINATION

- A. Prior to work at planting and areas, ascertain the location of all electric cables, conduits, under drainage systems and utility lines. The Contractor must take proper precautions so as not to disturb or damage sub-surface elements. Correction or repair of damage resulting from the failure to take these precautions will be at the Contractor's own expense.
- B. Verify that required underground utilities are available, in proper location, and ready for use. Coordinate with other trades, as necessary.
- C. Examine areas to receive plants for compliance with requirements and conditions affecting installation and performance.
 - 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
 - 2. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Commissioner and replace with new planting soil.
 - 3. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
 - 4. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 - 5. Uniformly moisten excessively dry soil that is not workable, and which is too dusty.
- D. Verify that all work requiring access through or adjacent to areas where plants are to be placed has been completed and no further access will be required. In the event that access will be required, this must be coordinated with the Commissioner.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

- A. The Commissioner reserves the right to direct the installation of all plantings. No plants may be installed until their locations have been approved.
- B. For the purpose of inspection, the Commissioner will have free access to all parts of work involved in planting operation. No work may be covered or concealed prior to inspection.
- C. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.
- D. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.



- E. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Commissioner's acceptance of layout before excavating or planting. Make minor adjustments as required.
- F. Lay out plants at locations as directed by the Commissioner. Stake locations of individual trees and shrubs and outline areas for multiple plantings.
- G. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.
 - 1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.
- H. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.
- I. Plants must be protected at all times from sun or drying winds. Plants that cannot be planted immediately upon delivery must be kept in the shade and well watered by the Contractor. Plants may not remain unplanted for longer than one day after delivery.

3.4 PLANT AREA ESTABLISHMENT

- A. Confirm Finish Grading has been accepted. Restore areas if eroded or settled beyond designated Finish Grades.
- B. Landscape Fabric: Place after tree planting, but prior to shrub, perennial, groundcover, and vines.

3.5 EXCAVATION FOR TREE PLANTING

- A. No plant pits may be dug until the proposed locations have been staked on the ground and approved by the Commissioner.
- B. Planting Pits and Trenches: Excavate circular planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are not acceptable. 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.
 - 1. Excavate approximately three times as wide as ball diameter for stock.
 - 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.
 - 4. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
 - 5. Maintain required angles of repose of adjacent materials as shown on the Drawings. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
 - 6. Maintain supervision of excavations during working hours.
 - 7. Keep excavations covered or otherwise protected when unattended by Installer's personnel.



8. If drain tile is shown on Drawings or required under planting areas, excavate to top of porous backfill over tile.
- C. Obstructions: Notify the Commissioner if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
- D. Drainage: Notify Commissioner if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.
- E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.
- F. Planting beds for Shrubs, Vines, Herbaceous, and Groundcover plants must be excavated to the dimensions and depths indicated on the plans and backfilled with approved topsoil. Bulbs, Corms, Tubers, Rhizomes and Annuals may be planted in the existing unamended soil, improved soil, or prepared planting beds and/or a water absorbent medium, as designated on the drawings.

3.6 TREE, SHRUB, AND VINE PLANTING

- A. Before 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. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.
- C. Orientation: Where possible, orient trees in the same cardinal direction as grown in the field in order to minimize damage to the bark of the trunk.
- D. Set balled and burlapped stock plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades. Set the tree or shrub straight and in the center of the pit, with the most desirable side facing toward the predominant view. Unless otherwise directed, plants will be set plumb.
 1. Topsoil removed from excavations may be used as planting soil if prior soil test results demonstrate suitability and if directed in writing by the Commissioner. Soil amendments should be added based on soil test recommendations. Subsoil excavated from the planting pit should be removed from the project site.
 2. After placing some backfill around root ball to stabilize plant, carefully cut, and remove burlap, rope, and wire baskets from tops and sides of root balls. Do not remove burlap, rope, and wire baskets from below root balls. Remove pallets, if any, before setting. All plastic or synthetic fabric must be removed from the ball at the time of planting. Wire must not be galvanized or aluminum wire.
 3. All ropes, stones, etc. must be removed from the pit before backfilling.
 4. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 5. Soil for backfill should be loose and friable and not frozen or compacted.
 6. 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.
 7. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
 8. Continue backfilling process. Water again after placing and tamping final layer of soil.



- E. Set container-grown stock plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades. Set the tree or shrub straight and in the center of the pit, with the most desirable side facing toward the predominant view. Unless otherwise directed, plants will be set plumb.
 - 1. Topsoil removed from excavations may be used as planting soil if prior soil test results demonstrate suitability and if directed in writing by the Commissioner. Soil amendments should be added based on soil test recommendations. Subsoil excavated from the planting pit should be removed from the project site. Carefully remove root ball from container without damaging root ball or plant.
 - 2. 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.
 - 3. Soil for backfill must be loose and friable and not frozen or compacted.
 - 4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
 - 5. Continue backfilling process. Water again after placing and tamping final layer of soil.
- F. Set and support bare-root stock in center of planting pit or trench with root flare 1 inch above adjacent finish grade. Set the tree or shrub straight and in the center of the pit, with the most desirable side facing toward the predominant view. Unless otherwise directed, plants will be set plumb.
 - 1. Topsoil removed from excavations may be used as planting soil if prior soil test results demonstrate suitability and if directed in writing by the Commissioner. Soil amendments should be added based on soil test recommendations. Subsoil excavated from the planting pit should be removed from the project site. Spread roots without tangling or turning toward surface, and carefully work backfill around roots by hand. Puddle with water until backfill layers are completely saturated. Plumb before backfilling and maintain plumb while working backfill around roots and placing layers above roots.
 - 2. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside soil-covered roots about 1 inch from root tips; do not place tablets in bottom of the hole or touching the roots.
 - 3. Continue backfilling process. Water again after placing and tamping final layer of soil.
- G. 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.
- H. Climbing Vines
 - 1. Vines must be planted so that the crown of the plant will be flush with finish grade or the top of the mulch layer, whichever is higher. Firm adjacent soil to avoid undue settling.
 - 2. Vine Stems must be unfurled and tied to and/or woven through adjacent supporting wires, fences, trellis structures, etc.
 - 3. All plants must be thoroughly watered within one hour of planting.

3.7 PERENNIALS AND GROUNDCOVERS

- A. Assure that soil moisture is within the required levels prior to planting. Irrigation, if required, must be applied not less than 12 hours prior to planting to avoid planting in overly saturated or muddy soils.
- B. Assure that soil grades in beds are smooth and as shown on the plans.



- C. Plants must be planted in even, triangularly spaced rows, at the intervals called out for on the drawings, unless otherwise noted. The first row of plants should be half the typical spacing distance from the bed edge unless otherwise directed.
- D. All plants must be carefully removed from containers or flats immediately prior to planting and set to the same depths as they were grown in the nursery bed or container, to the correct spacing indicated on the plans.
1. Dig planting holes sufficiently large enough to insert the root system without deforming the roots.
 2. Prior to planting, loosen sides and bottom of rootballs to encourage lateral root growth.
 3. Set the top of the root system at the grade of the soil.
 4. Press soil to bring the root system in contact with the soil.
 5. Spread any excess soil around in the spaces between plants.
- E. Mulch.
1. Apply mulch to the bed being sure not to cover the tops of the plants with or the tops of the root ball with mulch.
 2. Schedule the planting to occur prior to application of the mulch. If the bed is already mulched, pull the mulch from around the hole and plant into the soil. Do not plant the root system in the mulch. Pull mulch back so it is not on the root ball surface.
- F. Mycorrhizal fungi inoculants must be added to the top six to eight inches (6-8") of backfill soil in each planting pit and thoroughly mixed to distribute the inoculants. The material must be applied according to the following chart:

<u>Size of rootball or container</u>	<u>Ounces per plant</u>
1 gallon	1
2 gal.	2
3 gal.	3
5 gal.	3
7 gal.	3
10 gal.	3
15 gal.	3
20" B&B	6
24" B&B	9
30" B&B	9
36" B&B	12
12" B&B	12

After mixing, the plants must then be thoroughly settled in with water. Care must be taken to avoid bruising or breaking the roots when tamping the soil. All large and fleshy roots that are bruised or broken must be pruned, making a clean cut before planting.

- G. Water Retention Additive: Water Retention Additives must be applied at the time of planting during a dry planting. At planting, each tree receives three (3) ounces or amount specified by product instructions. Half should be added at a depth of 8-10 inches and the other half just below the finished surface. When planting shrubs, perennials or annuals, the product should be applied as per product instructions.
- H. Inorganic and Organic Soil Amendments and Fertilizers may be added to backfill topsoil at the time of



planting, or as a surface application after planting, as indicated by soil testing and directed by the Commissioner.

3.8 TREE STABILIZATION

A. Staking:

1. Tree caliper 3" to 6". (Stake trees of less than 3-inch caliper only as required to prevent wind tip out.) Use two stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend to the dimension shown on Drawings above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.
2. Flexible straps must be tied to the stake and secured the main leader or leaders of the tree with a half hitch, so that the strap does not complete encircle the trunk. Tension must be snug but not tight, allowing the tree to move with light breezes.

B. Staking and Guying: Stake and guy trees more than 14 feet in height and more than 3 inches in caliper unless otherwise indicated. Securely attach no fewer than three guys to stakes or deadmen.

1. Install staking and guying system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.
2. Provide flags for guy wires.

C. Stakes, wires and hoses, and straps must be removed at the end of the guaranty period and will become the property of the Contractor. At the time the stakes are removed any holes left by the stake must be filled with topsoil. Tree irrigation bags must be removed by the Contractor at the end of the guaranty period.

D. The Contractor will cultivate and rake over finished planting areas and will leave the site in an orderly condition. On level ground or slight slopes, create a shallow basin a little larger than the diameter of the plant pit around each plant, as shown on the plans, or as directed by the Commissioner. On steep slopes, the soil on the lower side of the plant is graded in such a manner that it will catch and hold water, as shown on the plans. Upon completion of planting, all debris and waste material resulting from the planting operation must be removed from the project area, and the affected area raked and cleaned, as necessary.

E. After the shallow tree basins and plant saucers and shrub beds, vines, perennials, and groundcovers have been prepared and planted, they must be mulched.

1. Shredded Bark Mulch:

- a. Trees: two to three inches (2-3") in depth, inside and along the outside edge of the basins/saucers. Do not allow mulch to touch the base of the tree trunk.
- b. Shrubs: two inches (2"), tapering to less than 1" at root balls.
- c. Perennials and Groundcovers: one to two inches (2") depth.

3.9 PRUNING

A. All on-site pruning will be supervised by the Commissioner.

B. Pruning at the time of planting must be avoided other than to remove dead, dying, or broken branches. Trees must not be pruned to compensate for the loss of root mass due to digging.

C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and

arboricultural practices. Do not cut tree leaders.

- D. Evergreen plants must not be pruned except to remove dead or broken branches.
- E. Remove only deadwood, suckers, broken, or damaged or injured branches, or branches that impinge on occupied pedestrian, vehicular or architectural space, from trees and shrubs. All pruning activities must retain the natural character of the tree or shrub, unless otherwise indicated.
 - 1. Pruning must be done with clean, sharp tools. No leaders will be cut.
 - 2. Each cut must be made carefully, at the correct location, leaving a smooth surface with no jagged edges or torn bark. The correct anatomical location is just beyond the branch collar. (See figures 1.2 and 1.3, taken from the I.S.A. certification study manual).
 - 3. Large or heavy limbs should be removed using three cuts. The first cut undercuts the limb one or two feet from the parent brand or trunk. The second cut is the top cut which is made slightly further out on the limb than the undercut. The third cut is to remove the stub.
 - 4. Do not apply pruning paint to wounds.

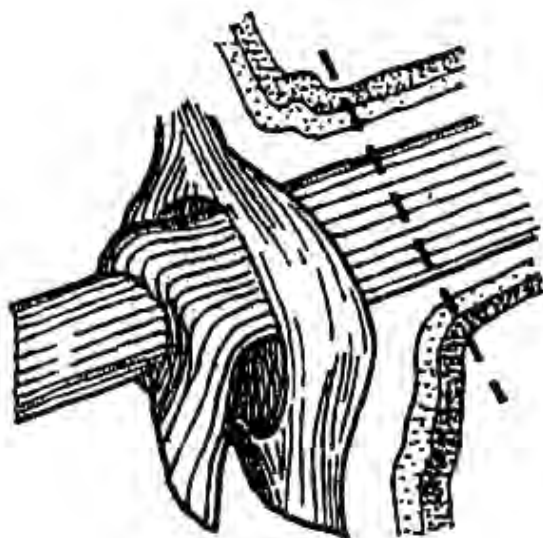


Figure 1.2

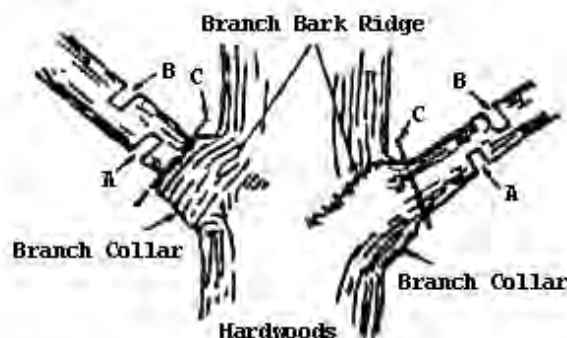


Figure 1.3

3.10 LANDSCAPE ESTABLISHMENT SERVICE

- A. Services required for the establishment of new plantings will begin immediately after each plant is planted and will continue for the period defined in Schedule B, Addendum to the General Conditions..
- B. Maintain plantings by pruning, cultivating, watering and filling irrigation bags, weeding, cultivating, edging, fertilizing, control of insect infestation and fungal and disease infections by means of spraying with an approved insecticide or fungicide, pruning, adjustment and repair of stakes, anchors, and wires, adjusting and repair of planting saucers, repair of minor washouts and gullies up to twelve inches (12") in depth,



resetting to proper grades or vertical position and all other horticultural operations as required to establish healthy, viable plantings until final acceptance.

- C. At the time of planting, the soil around each plant must be thoroughly saturated with water, and as many times later as seasonable conditions require, until final acceptance of the plant materials.
- D. Fill in as necessary soil subsidence that may occur because of settling, erosion or other processes. Replace mulch materials damaged or lost in areas of subsidence.
- E. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.
- F. Contractor must notify the Commissioner when pest control is to take place.
- G. All planting areas must be watered, cultivated, and weeded with hoes or other approved tools within the growing season extending from May 1st to October 1st, and such cultivating and weeding must be repeated periodically as required. Under no condition will weeds be allowed to attain more than six inches (6") of growth. The cost of such maintenance must be included in the bid price.

END OF SECTION 32 93 00



THIS PAGE INTENTIONALLY LEFT BLANK

FMS ID: LNCA13HAM



Department of
Design and
Construction

**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/buildnyc

Contract for Furnishing all Labor and Material Necessary and Required for:

CONTRACT NO. 1 GENERAL CONSTRUCTION WORK

Hamilton Fish Park Library Renovation

LOCATION: 415 East Houston Street
BOROUGH: New York, NY 10002
CITY OF NEW YORK

Contractor

Dated _____, 20____

Entered in the Comptroller's Office

First Assistant Bookkeeper

Dated _____, 20____

